Environmental Analysis
for the
Lake Rogers Timber Project

Prepared By
Kalispell Unit, Northwestern Land Office
Montana Department of Natural Resources and Conservation

September 2012

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CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name:	Lake Rogers Timber Project
Implementation Date:	winter 2012
Proponent:	Department of Natural Resources and Conservation, Northwestern Land Office, Kalispell Unit
Location:	Sections 20 & 30, Township 27N, Range23W Section 36, Township 27N, Range 24W
County	Flathead

I. TYPE AND PURPOSE OF ACTION

The Kalispell Unit, Montana Department of Natural Resources and Conservation (DNRC) is proposing the Lake Rogers Timber Project. The project area is located approximately 20 air miles southwest of downtown Kalispell, Montana within sections 20 & 30, T27N, R23W and section 36, T27N, R24W (see Vicinity Map in Attachment I). The acreage of state land involved in the project is held by the State in trust for the support of specific beneficiary institutions (*Enabling Act, 1889: 1972 Montana Constitution, Article X, Section 11).* s. 20 – Public Buildings, s. 30 – School of Mines, s. 36 – Common Schools.

Under the proposed action, approximately 3 million board feet would be harvested from approximately 847 acres (51 acres in Section 20, 343 acres in Section 30, and 453 acres in section 36). Approximately 0.20miles of road could be constructed in section 36. Estimated revenue of $500,000 would be generated for the beneficiaries. Specific objectives of this project are to maintain and improve forest health, reduce fuel loading, and increase forest productivity beneficial to future trust actions. If the Action Alternative is selected, activities could begin in the spring of 2013.

Project Purpose and Need:

1) Implement silvicultural treatments to improve forest health and vigor.

2) Sell forest products from trust lands within the project area to generate revenue for various trusts to produce the largest measure of reasonable and legitimate return over the long run for specific beneficiary institutions (*Section 77-1-202, Montana Codes Annotated (MCA)).*

Evaluations for road management and silvicultural treatments would also consider and incorporate: 1) insect and disease activity; 2) non-motorized recreational uses; and 3) control/containment of present weed infestations.

II. PROJECT DEVELOPMENT

1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED:

On 06/29/2012, the DNRC sent scoping letters to adjacent landowners and other known interested parties and organizations. A public notice was posted in *The Daily Interlake* on 07/01/2012 and 07/08/2012. We received one letter and one e-mail in support of the project. Two phone calls and 1 e-mail were received from adjacent landowners with concerns for road dust, weeds, and affects to Bald Eagles and Loons. Hydrological, soils, wildlife and vegetative issues were identified by DNRC specialists and field foresters for both the No Action and the Action Alternative.

2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:

DNRC is classified as a major open burner by the DEQ, and is issued a permit from the DEQ to conduct burning activities on state lands managed by the DNRC. As a major open burning permit holder, DNRC agrees to comply with all of the limitations and conditions of the permit.

3. ALTERNATIVES CONSIDERED:

No Action Alternative: Under the No Action Alternative, no activity would be undertaken. No timber would be harvested. The No Action alternative would likely result in decreased growth rates and increased fuel loading within the timber stands. The potential for insect infestations would likely increase. This alternative would not produce revenue for the Trust Beneficiary. Effects of the No Action Alternative are further described in the Resource Analyses in Attachment 2.

Action Alternative: Under the Action Alternative, DNRC would harvest up to 3 million board feet from approximately 51 acres in Section 20, 343 acres in Section 30, and 453 acres in section 36. Timber would be harvested using tractor logging with conventional, mechanical or cut-to-length operations. Some skyline or cable yarding may be needed on some steeper ground in section 36. Silvicultural treatments would promote the regeneration of western larch and ponderosa pine and improve the overall health and vigor of the stands. In addition to timber harvest, approximately 0.20 miles of new road may need to be constructed to access a portion of the project area.

Issues surrounding this proposed action have either been resolved or mitigated through project design or would be included as specific contractual requirements of this project. Recommendations to minimize direct, indirect and cumulative effects have been incorporated in the project design (Attachment II, Resource Analyses; Attachment III, Prescriptions: Attachment IV, Mitigations;).

III. IMPACTS ON THE PHYSICAL ENVIRONMENT

4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE:

Harvest activities would comply with Best Management Practices (BMP's) and would use existing roads and segments of existing skid trails where feasible. Mitigations include: limiting equipment operations to minimize soil compaction and rutting, planning appropriate skid trails, limiting disturbance and scarification, and retaining adequate amounts of large woody debris and fine litter following harvest. Thus, direct, indirect, and cumulative effects to the soil resource would be minimal.

Please refer to Attachment 2, Soils Analysis for a more detailed analysis, and Attachment 4, Mitigations for a more detailed description of mitigations.

5. WATER QUALITY, QUANTITY AND DISTRIBUTION:

Please refer to Attachment II, Water Resources Analysis for a more detailed analysis, and Attachment IV, Mitigations for a description of mitigations.

6. AIR QUALITY:

The project is located in Montana State Airshed 2 and outside the Kalispell Impact Zone. Under the Action Alternative, potential post-harvest burning of logging slash would produce some particulate matter. Impacts are expected to be minor and temporary with slash burning to be conducted when conditions favor good smoke dispersion. All burning would be conducted during times of adequate ventilation and within the existing rules and regulations.

The DNRC is a member of the Montana/Idaho Airshed Group which was formed to minimize or prevent smoke impacts while using fire to accomplish land management objectives and/or fuel hazard reduction (Montana/Idaho Airshed Group 2006). The Group determines the delineation of airsheds and impact zones throughout Idaho and Montana. Airsheds describe those geographical areas that have similar atmospheric conditions, while impact zones describe any area in Montana or Idaho that the Group deems smoke sensitive and/or having an existing air quality problem (Montana/Idaho Airshed Group 2006).

The project area is located within Montana Airshed 2.

No Action Alternative: Under the No Action Alternative, no slash piles would be burned within the project areas. Thus, there would be no effects to air quality within the local vicinity and throughout Airshed 2.

Action Alternative: Under the Action Alternative, slash piles consisting of tree limbs and tops and other vegetative debris would be created throughout the project area during harvesting. These slash piles would ultimately be burned after harvesting operations have been completed. Burning would introduce particulate matter into the local airshed, temporarily affecting local air quality. Over 70% of emissions emitted from prescribed burning is less than 2.5 microns (National Ambient Air Quality PM 2.5). High, short-term levels of PM 2.5 may be hazardous. Within the typical column of biomass burning, the chemical toxics are: Formaldehyde, Acrolein, Acetaldehyde, 1,4 Butadiene, and Polycyclic Organic Matter.

Burning within the project area would be short in duration and would be conducted when conditions favored good to excellent ventilation and smoke dispersion as determined by the Montana Department of Environmental Quality and the Montana/Idaho Airshed Group. Prior to burning a "Prescribed Fire Burn Plan" would be done for the area. The DNRC, as a member of the Montana/Idaho Airshed Group, would burn only on approved days. Thus, direct and indirect effects to air quality due to slash pile burning associated with the proposed action would be minimal.

Burning that may occur on adjacent properties in combination with the proposed action could potentially increase cumulative affects to the local airshed and the Class I Areas. Thus, cumulative effects to air quality due to slash pile burning associated with the proposed action would also be expected to be minimal.

Cumulative effects to air quality would not exceed the levels defined by State of Montana Cooperative Smoke Management Plan (1988) and managed by the Montana Airshed Group. Prescribed burning by other nearby airshed cooperators (for example the U.S. Forest Service) would have potential to affect air quality. All cooperators currently operate under the same Airshed Group guidelines. The State, as a member, would burn only on approved days. This should decrease the likelihood of additive cumulative effects.

Harvesting operations would be short in duration. Thus, direct, indirect, and cumulative effects to air quality due to harvesting and hauling associated with the proposed action would be minimal.

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7. VEGETATIVE COVER, QUANTITY AND QUALITY:

Logging activities have occurred within the project area since the 1920's. The predominant cover type is western larch / Douglas-fir and ponderosa pine. No sensitive plants listed by the Montana Natural Heritage Program were identified in the project area.

Under the Action Alternative, timber harvest would occur on approximately 51 acres in Section 20, 343 acres in Section 30, and 453 acres in section 36 and would be focused on the removal of shade tolerant species and those infected or susceptible to insect and disease mortality, namely lodgepole pine. Regeneration of western larch and ponderosa pine would be promoted by favoring retention of larch and ponderosa pine and providing some site preparation through harvest activities and follow-up treatments. These changes would move stands in the project area toward desired future conditions. Occurrence of noxious weeds may increase.

Recommendations to minimize direct, indirect and cumulative effects have been incorporated into the project design (Attachment 1; Attachment 2, Vegetation Analysis; Attachment 3, Prescriptions; Attachment 4, Mitigations).

Measures to minimize noxious weeds, insects and disease are included in the project design (Attachment 4, Mitigations).

8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS:

For all other resources related to this heading, please refer to Attachment 2, Wildlife Analysis and Water Resource Analysis for a detailed analysis to terrestrial, avian, and aquatic habitats. See Attachment 4, Mitigations for a detailed description of mitigations to these resources.

9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES:

Please refer to Attachment 2 Wildlife Analysis for a more detailed analysis and Attachment 4, Mitigations, for a more detailed description of mitigations.

10. HISTORICAL AND ARCHAEOLOGICAL SITES:

A DNRC archaeologist has reviewed this project. Significant sites or artifacts were not identified during these reviews.

11. AESTHETICS:

Lake Rogers is mostly contained in section 30. Approximately 32 residential lease lots border the northern edge of the lake. A boat access is maintained on the northeast end of the lake by Montana Fish, Wildlife, and Parks (FWP). An unimproved boat access is present on the northwest end of the lake. No harvest activity will occur on the residential lease lots or in the boat access maintained by Montana FWP. As a result, there will be little to no change in visuals from the lake. There is no legal public access to sections 20 and 36. These areas receive dispersed recreation such as hunting and firewood cutting. Project implementation should not have an adverse visual impact in the area (Attachment 4, Mitigation).

12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY:

No impacts are likely to occur under either alternative.

13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA:

No other environmental documents are pertinent to this project.

IV. IMPACTS ON THE HUMAN POPULATION

14. HUMAN HEALTH AND SAFETY:

Human health would not be impacted by the proposed timber sale or associated activity. There are no unusual safety considerations associated with the proposed timber sale.

15. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION:

Timber harvest would provide continuing industrial production in the Flathead Valley.

16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT:

People are currently employed in the wood products industry in the region. Due to the relatively small size of the timber sale program, there would be no measurable cumulative impact from this proposed action.

17. LOCAL AND STATE TAX BASE AND TAX REVENUES:

People are currently paying taxes from the wood products industry in the region. Due to the relatively small size of the timber sale, there would be no measurable cumulative impact from this proposed action on tax revenues.

18. DEMAND FOR GOVERNMENT SERVICES:

Log trucks hauling to the purchasing mill would result in temporary increased in traffic on the Rogers Lake County Road. This increase is a normal contributor to the activities of the local community and industrial base, and they cannot be considered a new or increased source of demand.

19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS:

On June 17, 1996, the Land Board approved the SFLMP. The SFLMP provides the philosophy adopted by DNRC through programmatic review (DNRC, 1996). The DNRC will manage the lands in this project according to this philosophy, which states:

> *Our premise is that the best way to produce long-term income for the trust is to manage intensively for healthy and biological diverse forests. Our understanding is that a diverse forest is a stable forest that will produce the most reliable and highest long-term revenue stream…In the foreseeable future, timber management will continue to be our primary source of revenue and our primary tool for achieving biodiversity objectives.*

On March 13, 2003, the DNRC adopted Rules (Administrative Rules of Montana [ARM] 36.11.401 through 450). These Rules provide DNRC personnel with consistent policy, direction, and guidance for the management of forested trust lands.

DNRC is managing the habitats of threatened and endangered species on this project by implementing the Montana DNRC Forested Trust Lands Habitat Conservation Plan (HCP) and the associated Incidental Take Permit (Permit) that was issued by the United States Fish & Wildlife Service (USFWS) in February of 2012 under Section 10 of the Endangered Species Act. The HCP identifies specific conservation strategies for managing the habitats of grizzly bear, Canada lynx, and three fish species: bull trout, westslope cutthroat trout, and Columbia redband trout. This project complies with the HCP.

20. ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES:

The project area receives dispersed recreation in the form of hunting. A boat access is maintained on the northeast end of Lake Rogers by Montana Fish, Wildlife, & Parks. An unimproved boat and lake access is present on the northwest end of the lake. No timber harvest activities are planned within 200 feet of the lake. Implementation of the proposed project will not displace any current uses of the area. Use is expected to remain the same following this project.

21. DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING:

There would be no measurable cumulative impacts related to population and housing due to the relatively small size of this project, and the fact that people are already employed in this occupation in the region.

22. SOCIAL STRUCTURES AND MORES:

No impacts related to social structures and mores would be expected under either alternative.

23. CULTURAL UNIQUENESS AND DIVERSITY:

No impacts related to cultural uniqueness and diversity would be expected under either alternative.

24. OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES:

Costs, revenues and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, or anything that could affect to buyer's willingness to pay for. The Action Alternative would generate an estimated return to the school trust of $500,000. The No Action alternative would not generate any return to the trust.

EA Checklist Prepared By:	**Name:** Pete Seigmund	**Date:** September 2012
	Title: Management Forester	

V. FINDING

25. ALTERNATIVE SELECTED:

The Montana Department of Natural Resources and Conservation has completed the environmental assessment (EA) for the proposed Lake Rogers Timber Project on State School Trust Lands described on page 3 of this document. After a thorough review of the EA, public comments, the project file, Department policies, standards, and guidelines, I have made the following decisions concerning this project:

The alternatives proposed for consideration in this EA were the No-Action and Action Alternatives. The Action Alternative would allow for the harvest of approximately 3 million board feet of timber from 847 acres, and include 0.2 miles of new road construction. Information contained in the EA indicates that issues associated with vegetation (including weeds and slash disposal), water resources and soils (including road and forestry BMP's), and wildlife (including snag and woody debris recruitment, T & E species requirements, open road densities, and disturbance to nesting loons, hawks and eagles) are identified and have been resolved or mitigated by the design of the project, or those mitigations would be specific contractual requirements of the project.

The Action Alternative has been selected for the following reasons:

- The Action Alternative meets the Project Purpose and Need listed under section I. of the EA:
  1) Implement silvicultural treatments to improve forest health and vigor.
  2) Sell forest products from trust lands within the project area to generate revenue for various trusts to produce the largest measure of reasonable and legitimate return over the long run for specific beneficiary institutions (*Section 77-1-202, Montana Codes Annotated (MCA)).*

- The proposed use is consistent with State and local policies, laws, and regulations.

26. SIGNIFICANCE OF POTENTIAL IMPACTS:

Upon review of the project and the analysis herein, I find that none of the project impacts are regarded as severe, enduring, geographically widespread, or frequent. Further, I find that the quantity and quality of the natural resources, including any that may be considered unique or fragile, will not be adversely affected to a significant degree. I find no precedent for the future actions that would cause significant impacts, and I find no conflict with local, State, or federal laws, requirements, or formal plans. In summary, I find that adverse impacts would be avoided, controlled, or mitigated by the design and implementation of the project to an extent that they are not significant.

27. NEED FOR FURTHER ENVIRONMENTAL ANALYSIS:

☐ EIS ☐ More Detailed EA ☒ No Further Analysis

EA Checklist Approved By:	**Name:** Greg Poncin **Title:** Kalispell Unit Manager
Signature: */s/ Greg Poncin*	**Date:** 10- 25 -12

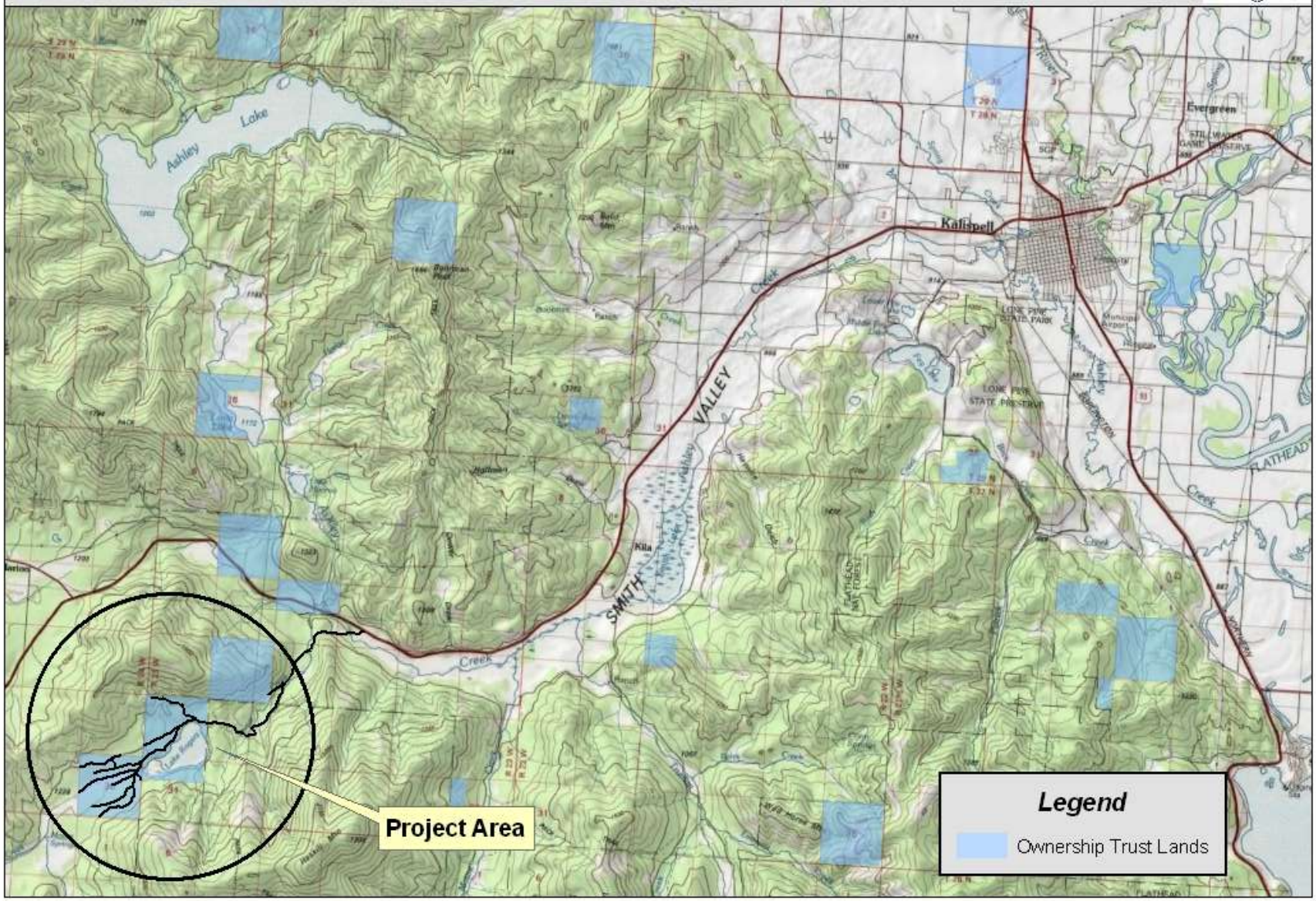
Attachment I: MAPS

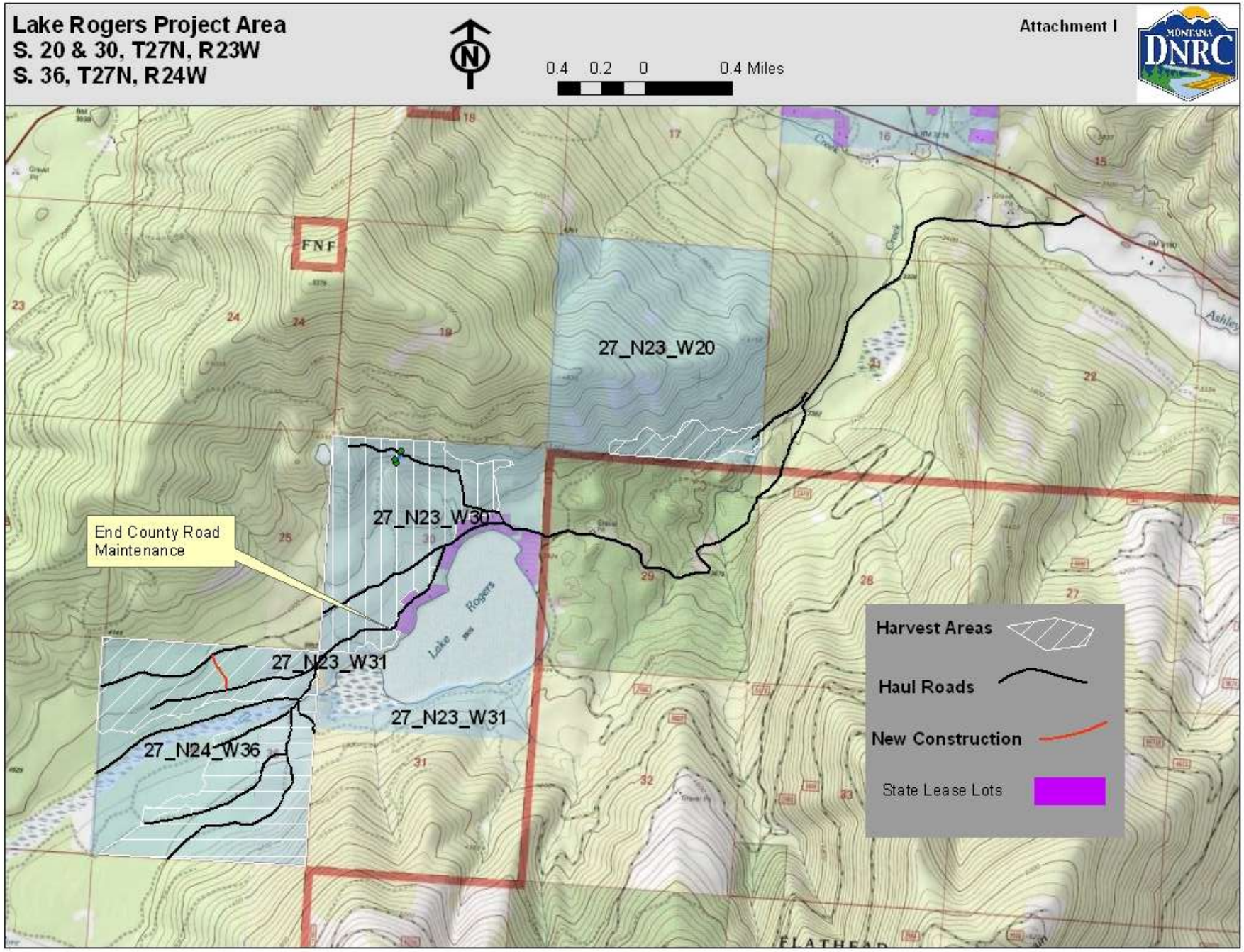
Vicinity Map
&
Harvest Area Map

Lake Rogers Project Area
S. 20 & 30, T27N, R23W
S. 36, T27N, R24W

Attachment I

1 0.5 0 1 Miles




Lake Rogers Project Area
S. 20 & 30, T27N, R23W
S. 36, T27N, R24W
Attachment I
0.4 0.2 0 0.4 Miles
FNF
27_N23_W20
27_N23_W30
End County Road Maintenance
Lake Rogers
27_N23_W31
27_N23_W31
27_N24_W36
Harvest Areas
Haul Roads
New Construction
State Lease Lots

Attachment II

Resource Analyses: Existing Conditions & Direct, Indirect and Cumulative Effects

Vegetation Analysis

Water Resources Analysis

Soils Analysis

Wildlife Analysis

Attachment II: Resource Analyses
Existing Conditions & Direct, Indirect and Cumulative Effects

Introduction

This section identifies and describes those resources that may be affected by the proposed action and describes the environmental effects of each alternative on the resources. The section is organized by general resource categories and their associated issues. The descriptions of the existing conditions found in this section can be used as a baseline for comparison with the Action Alternative.

Cumulative effects from current management and foreseeable future State actions are discussed. These include other active timber sales, those in the planning stage, ongoing maintenance, and other uses of the areas being analyzed. Direct, indirect and cumulative effects on the resources being analyzed were considered.

General description of the area

The proposed Lake Rogers Timber Project area is located approximately 20 air miles southwest of Kalispell, Montana and includes approximately 1,734 acres of State Trust Lands. It is located within sections 20 & 30, T27N, R23W and section 36, T27N, R24W. State Trust Lands within the project share property boundaries with numerous private landowners and the US Forest Service. Several other analysis areas were delineated to assess direct, indirect and cumulative effects of the alternatives considered. More specific details about these are contained under each corresponding resource heading.

Vegetation Analysis

The vegetation section describes present conditions and components of the forest as well as the anticipated effects of both the No Action and the Action Alternatives. Issues expressed during initial scoping by the public and internally were:

- Current stand conditions are increasing the risk of insect infestations and may contribute to widespread bark beetle induced mortality (lodgepole and ponderosa pine).
- Insects and disease may affect timber productivity and value.
- Timber harvesting and associated activities may increase noxious weeds in the project area.

These issues can be evaluated by analyzing the anticipated changes in current forest conditions in the project area, in conjunction with the extent and location of silvicultural treatments.

Analysis Methods

Administrative Rules of Montana (ARM 36.11.404) direct DNRC to take a coarse filter approach to favor an appropriate mix of stand structures and compositions on state lands, referred to as a desired future condition. The following characteristics: forest composition, age class distribution, cover type and structure, are used to describe current forest and stand conditions in comparison to the estimated natural forest characteristics for Montana prior to extensive influences from fire suppression, logging, and development. This analysis will compare the desired stand conditions that DNRC believes to be appropriate for the site with current stand conditions.

Forest/Timber Analysis Methods **–**

The DNRC site–specific model (ARM 36.11.405), was used to determine the characteristics of the desired future condition and to evaluate the potential direct, indirect, and cumulative effects. This model compares the 1930's forest inventory data used in *Losensky's* 1993 analysis and subsequent 1997 report of estimated proportions of forest stand structural stages by cover type historically represented throughout Montana, to the most recent DNRC Stand Level Inventory database that estimates current forest conditions. More recent field observations and tree data were gathered to further refine specific forest stand characteristics within the project area. This data is available at the Kalispell Unit. The method used to analyze current and appropriate (desired future conditions; DFC) stand conditions, old-growth timber stands, and stand development follows:

- *Current & Appropriate Conditions:* Two filters were developed for the Kalispell Unit Landscape and applied the most recent Stand Level Inventory (SLI). The filters were assigned cover types similar to those used in the 1930's inventory. The first filter followed the 1930's criteria exactly, or as closely as possible, representing current conditions. The second filter represents the department's DFC as defined in ARM 36.11.404 and 405. The second filter for appropriate conditions assigns cover types using criteria primarily designed to help address the situation where succession from one cover type to another is occurring. This successional filter was developed to indicate that those areas in the absence of fire suppression, introduced pathogens, and timber harvesting would likely have been assigned to a different cover type than the current cover type filter would suggest. The appropriate filter estimates, from the current stand conditions, what cover type representation might have looked like in 1900.
- *Old Growth Timber Stands:* the methods to identify old growth timber stands, as defined by ARM 36.11.403 (48), are based on the Kalispell SLI data. The process uses the SLI to identify stands that may meet the minimum criteria (number of trees per acre that have a minimum dbh and minimum age) for a given habitat type group as described in Green et al (1992), *Old Growth Forest Types of the Northern Region*. Field surveys were used to verify that the definition is met in the identified stands and to determine if additional stands meet the definition.

- *Stand Structure/Development:* the analysis on stand structure and development is qualitative, and discusses the conditions of timber stands, including how various natural and man-caused disturbances and site factors have affected and may continue to affect timber stand development.

Sensitive Plant Analysis Methods **–**

The Montana Natural Heritage Program (MNHP) database was consulted by DNRC for information regarding occurrence of plant species of special concern and the potential for sensitive plants and their habitats within the project area

Noxious Weed Analysis Methods **–**

During field reconnaissance, DNRC personnel assessed road conditions, road locations, various susceptible timber stands, stream conditions, and generally evaluated noxious weed occurrence, extent and location.

Analysis Area

Forest/Timber Analysis Area **–**

This analysis area includes 3 geographic scales for assessing potential direct, indirect and cumulative effects on forest cover type, species composition, the distribution of age classes, structural stages, and fragmentation.

- Climatic Section M333B - **Lower Flathead Valley (Losensky 1997) Scale** was used in this analysis for comparing historic conditions related to the distribution of forest cover types and age classes, to current conditions within the project area. The Lower Flathead Valley geographic area includes Flathead Lake west to the Montana border, from the Canadian border south to Missoula, MT (Losensky 1997).

- The **DNRC Kalispell Landscape Scale** includes all scattered forested trust land parcels, administered by the Kalispell Unit for DNRC. This geographic area is a subset of the above Lower Flathead Valley Climatic Section and includes school trust lands in the vicinity of Whitefish, MT south to Arlee, MT and school trust lands in the vicinity of Bigfork, MT west to the Thompson Chain of Lakes. Current and appropriate conditions related to forest cover types and age class distribution were analyzed on this scale.

- The **Lake Rogers Project Area Level Scale** includes all trust lands within the project area and more specifically those stands proposed for harvesting under each alternative. This scale was used to analyze expected changes in current forest conditions of the project area.

***Sensitive Plants/Noxious Weeds Analysis Area* –**

The analysis area for noxious weeds and sensitive plants species, are trust lands within the project area. Surveys identifying sensitive plant occurrences were compared to proposed harvest sites and road construction locations for assessing direct, indirect, and cumulative effects, and developing mitigation measures, if needed.

Existing Conditions

General Forest Vegetation Information –

The existing vegetative types, more specifically forest habitat types and cover types within the Kalispell Landscape and the Lake Rogers project area, reflect the varied influences of site factors, fire regimes or disturbance patterns, and past management activities.

Site conditions vary depending upon the physiographic and climatic factors associated with geographic locations. Soil types, slope aspect and position, length of growing season, and moisture availability influence the type, growth and development of forest vegetation. These site factors are considered in the forest habitat classifications (Pfister et al. 1977), used to generally describe forest vegetation, forest stand development, and relative forest productivity associated with the given site and climatic factors.

***Stand History/Past Management* –**

Secton 20 – Porter Creek: Section 20 was first logged between 1924 and 1927. Approximately 1.3 MMBF (million board feet) of ponderosa pine and Douglas-fir was harvested from the NE¼. Two more timber sales occurred in 1946 and 1947 harvesting approximately 1.7 MMBF (730 MBF (thousand board feet) of ponderosa pine and 342 MBF of western larch/Douglas-fir) of timber from both the North and South halves of the Section. Another harvest occurred in 1954 when approximately 1.7 MMBF was harvested from the NW¼. Six christmas tree permits were sold between 1952 and 1957. The most recent timber harvest occurred in the late 1990's and removed 1,172 MBF of Douglas-fir and western larch. with some small permits in the in 1960's. The first major timber harvest occurred in 1978 and 1979. Active fire suppression starting in the 1930's has limited the extent of wildfires to small acreages, generally less than ¼ acre in size.

Section 30 – Lake Rogers: This section was first harvested in 1945. 3.35 MMBF (million board feet) of ponderosa pine was harvest and 4.7 MMBF of western larch/Douglas-fir. The most recent timber harvest occurred from 1982 to 1985 which harvest approximately 1.9 MMBF of lodgepole pine, 1.5 MMBF of Douglas-fir, 869 MBF of western larch, and 569 MBF of ponderosa pine. This was a total sale volume of 4.936 MMBF and included section 36. This section has been heavily cut for firewood since the 1970's.

Section 36 – Coyote Mountain: This section was first harvested in 1946. 4.65 MMBF (million board feet) of western larch/Douglas-fir was harvested. The most recent timber harvest occurred from 1982 to 1985 which harvest approximately 1.9 MMBF of lodgepole pine, 1.5 MMBF of Douglas-fir, 869 MBF of western larch, and 569 MBF of ponderosa pine. This was a total sale volume of 4.936 MMBF and included section 30. This section has been heavily cut for firewood since the 1970's.

Forest Habitat Types –

In the Lake Rogers Project Area, the area is dominated by forest habitat types in the lower elevation Douglas-fir series (*pseudotsuga mensiesii).* Ponderosa pine, western larch, Douglas-fir, and lodgepole pine are the most prevalent trees species. Fire scars were prevalent on older ponderosa pine and western larch in the project area.

Timber productivity in the Douglas-fir/dwarf huckleberry type and Douglas-fir/snowberry type is generally good. Growth of ponderosa pine is excellent in the Douglas-fir/dwarf huckleberry type and often contains a large component of lodgepole pine.

Fire Regimes –

Fire regimes for the Kalispell Landscape are variable, given the broad and scattered nature of trust lands, but are predominantly within the moderate severity fire regime. As a whole, the forest exists as a mosaic of differing age and size classes that have developed from different human activities, fire frequencies and intensities in relation to other site factors such as aspect, elevation, weather, stand structure, and fuel loadings. Areas of frequent fire have produced WL/DF, PP, and DF cover types. In low severity fire regimes, fires occur frequently and create relatively smaller patches of open-grown forest. Historically, these low severity regimes maintained stand conditions that were resistant to stand replacement fires, by regularly consuming forest fuels, killing small trees, and pruning boles of small trees. As fire intervals become longer and management activities occur less frequently, more shade tolerant tree species begin to develop in the understory and stands tend to be multi-storied, with varied patch sizes. These characteristics reflect a moderate to low severity fire regime. High severity fire regimes are characterized by large patch sizes and stand replacement fires, but often include low severity fires that act as a thinning agent, or create small openings where clumps of trees die where small crown fires erupt.

The forest types located within the project area experienced a history of frequent ground fires which perpetuated open, park-like conditions dominated by ponderosa pine and western larch. A large component of lodgepole pine was present as well.

As a result of fire suppression in last 100 years, fire return intervals have been lengthened and fire intensity has increased due to increased fuel loadings vertically and horizontally. It is fairly evident that stand composition has changed due to fire suppression and past timber harvests. Douglas-fir composition has increased greatly as the occurrence of ponderosa pine and western larch has diminished.

Forest Age Class & Cover Type Distribution –

Table 3–1 compares the DNRC Kalispell Landscape (current cover types) with historical data (appropriate cover types) from Losensky (1997) for the Lower Flathead Valley section, as an assessment of desired future conditions regarding cover types.

Table 3–1. Current and appropriate cover types for the Kalispell Unit.

Cover Type	Current Cover Type (Acres	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
SAF	2249.9	254.8	1995.1
DF	1646.5	1029.4	617.1
HW	449	207	242
LP	2269.2	1376.8	892.4
MC	10265.8	2282.3	7983.3
PP	10636.9	11936.2	-1299.3
OTHER	3635.4	3576.2	59.2
WL/DF	25494.6	32974.5	-7479.9
WWP	567.6	3577.7	-3010.1
TOTAL	57214.9	57214.9	--

SAF = subalpine fir. DF = Douglas-fir. LP = lodgepole pine. MC = mixed conifer. PP = ponderosa pine. WL/DF = western larch/ Douglas-fir. WWP = western white pine. Other = non stocked lands, nonforest, or water. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

The longer intervals between disturbances and commodity extraction generally explain the decrease in the WL/DF and PP cover types. The PP, WL/DF, and WWP cover types are not as well represented within the Kalispell Landscape as estimated for the early 1900's. Most notable, is the conversion of over 11,000 acres in the WL/DF, PP, and WWP cover types, over the last 100 years, to the present over abundance of the MC and SAF cover types by approximately 10,000 acres.

Active fire suppression initiated in the early 1900's has interrupted wildfire frequencies and intensities in conjunction with 50 years or more of logging practices that favored the removal of commercially valuable western larch (*Larix occidentalis),* ponderosa pine (*Pinus ponderosa),* western white pine (*Pinus monticola)* and Douglas-fir (*Pseudotsuga menziesii)* for railroad ties, mining timbers, and construction lumber. Many open, mature stands dominated by western larch and other seral species with even-aged patches of immature seral trees in the understory have been replaced with more densely stocked stands in both the overstory and understory. These stands often include a higher percentage of more shade tolerant trees such as, Douglas-fir, grand fir (*Abies grandis*), sub-alpine fir (*Abies lasiocarpa*), or spruce (*Picea spp*.), as a result of longer intervals between disturbances.

Table 3–2 makes the same comparison for determining desired future conditions for the Lake Rogers harvest areas.

Table 3–2. Current and appropriate cover types & stand compositions for the Lake Rogers project area.

Cover Type	Current Cover Type (Acres)	Appropriate Cover Type (Acres)	Current Type Minus (-) Appropriate Type (Acres)
SAF	0	0	0
DF	63	0	63
HW	0	0	0
LP	130	51	79
MC	0	0	0
PP	420	763	-343
Other	0	0	0
WL/DF	234	33	201
WWP	0	0	0
TOTAL	847	847	--

SAF = subalpine fir. DF = Douglas-fir. LP = lodgepole pine. MC = mixed conifer. PP = ponderosa pine. WL/DF = western larch/ Douglas-fir. WWP = western white pine. Other = non stocked lands or nonforest. The Current Type minus Appropriate Type column above lists the excess and deficit (-) acres for each Cover Type.

The Lake Rogers project area reflects the same trend in forest cover type shifts as the Kalispell landscape, notably PP cover types represent a smaller proportion of the cover types, and DF and LP represents a larger proportion, than likely occurred in the early 1900's.

Age class distributions in conjunction with other forest stand conditions or characteristics are useful in determining general historic conditions for inferring desired future conditions. Table 3– 3 displays age

class distribution on the project area and landscape scales. Stands in the seedling-sapling age class (0-39 years) are under-represented compared to the historical condition for the Kalispell landscape. The 150+ age class is over represented for the Kalispell Unit and the project area. This deviation from historical conditions can partially be explained by successful fire suppression increasing the interval between large, stand replacement fires and logging practices that did not necessarily create a similar disturbance to a wildfire.

Table 3–3. Historic and current age class distribution.

Percent of Analysis Areas by Age Class Groups (years):				
Analysis Area	00 - 39	40- 99	100 - 149	150+
M33B (historic)	36	13	15	36
Kalispell (current)	10	21	30	39
Project area (current)	0	77	23	0

Distribution of Old-Growth Stands –

As per the Land Board's decision in February, 2001, the DNRC adopted definitions for old growth by forest habitat type groups, based on minimum number and size of large trees per acre and age of those trees as noted in *Old-Growth Forest Types of the Northern Region (Green et al. 1992).* DNRC's SLI identified no stands within the project area meeting the minimum criteria. Field reconnaissance confirmed that no old growth is present within the project area.

Stand Structure and Development –

Stand structure and patch size indicates a characteristic of stand development and disturbance and how a stand may continue to develop. Stand structure is classified as single-storied, two-storied, or multi-storied. Patch size for this project is estimated from stand sizes and provides further insight into the severity of a disturbance as it relates to dominant tree canopies. Table 3-4 displays the percent of area in the project area and Kalispell Landscape by stand structure class and estimates of stand size.

Table 3–4. Proportion (%) of analysis area by stand structure and estimated patch size.

Stand Structure	Kalispell Landscape	Kalispell Average Stand Size	Project Area	Project Area Average Stand Size
Single-storied	15%	24 acres	0%	n/a
Two-storied	3%	28 acres	0%	n/a
Multi-storied	82%	31 acres	100%	39 acres

Single-storied stands are most often associated with stand replacement events, such as severe fires or regeneration harvests including clearcutting or seedtree cutting. Stands are fairly simple in vertical structure and are often even aged. Regeneration harvests, such as a seedtree or shelterwood,that retain 10% or more of the upper crown canopy and has a seedling/sapling understory are considered 2-storied stands. Two-storied stands have simple vertical structure and are frequently even aged, although at least two age classes are generally present. The multi-storied condition arises when a stand has progressed through time and succession to the point that shade-tolerant species are encroaching into a shade-intolerant overstory. Three or more age classes may be present in these stands and vertical structure can be complex. These stands often experience a long interval between disturbances. Stand size refers to

openings created by disturbances and provides insight regarding the severity of a disturbance event regarding tree mortality. Larger patch sizes are generally associated with moderate and high severity fire regimes or regeneration harvests. Smaller sizes are attributed to low or moderate severity fire regimes, and harvest treatments that retain larger proportions of the overstory.

Over 80 % of the Kalispell Landscape and 100% of the project area consists of stands with multi-storied structures. The various tree canopy levels may be patchy in nature or well distributed and several age classes are usually present. Single or two-storied, even aged structures are absent in the project area.

Timber Productivity and Value –

Insects: Mountain pine beetle activity has been increasing the past 3 years mostly in the lodgepole pine and to a lesser extent in the ponderosa pine. As stocking increases and trees compete for resources, they become more susceptible to attacks by bark beetles.

Tree Vigor: Radial growth rates are moderate to good in the project area. Tree vigor is moderate to poor in the lodgepole pine stands making them more susceptible to bark beetle attack.

Sensitive Plants –

A review of the records from the MNHP for the project indicated no plant species of special concern identified within the project area. Field reconnaissance also indicated no unique or sensitive plants within the project area.

Noxious Weeds –

Invasions of noxious weeds are prevalent along open roads and trails used by motorized vehicles. Native plant species may not re-colonize these areas. Several factors increase the likelihood of continued weed encroachment in the project area. They are: proposed timber harvest and associated log hauling, persistent and increasing usage of the area for recreation.

Environmental Effects

Forest Age Class & Cover Type Distribution –

No Action Alternative – Direct and Indirect Effects

Under the No Action Alternative, natural processes would continue to have a direct influence on these forest characteristics. In the absence of wildfires, the effects of current insect infestation-induced mortality will continue to influence both short and long term age class distribution and cover type representation.

Openings created in the canopy from bark beetle mortality are not expected to resemble natural fire effects. Openings are likely to be smaller and many may continue to be stocked with younger pole-sized, shade tolerant trees. Without duff reduction and soil exposure, the regeneration of openings is expected to favor shade tolerant species over seral species. The lack of regeneration under denser canopies or the predominance of Douglas-fir in numerous understories would perpetuate the trend of increasing DF cover types over much of the project area. Without fire, the older age classes from 100 years up would continue to dominate the area and the 0-39 and 40 to 99 age classes would continue to decline, as younger stands move into the next age class without replacement.

No Action Alternative – Cumulative Effects

Under the No Action Alternative, there would likely be a decline in acreage in PP cover types. PP and WL composition will continue to decrease leading to a shift from PP to DF or WL/DF cover types. Across the landscape, fire suppression, insect and disease occurrence, and increasing human use may influence cover type

and age class distribution to an unknown degree. In the absence of stand replacement fires, variability of age class and cover type distribution would decline.

Action Alternative – Direct and Indirect Effects

As a result of harvesting, PP cover types would persist within the harvest units. Dominant tree composition would begin to move toward historic conditions. By removing shade tolerant species (mostly Douglas-fir) and retaining seral species, PP cover types would persist for a longer time. Stands would mostly remain in the existing age class.

This alternative would harvest 847 acres (51 acres in section 20, 343 acres in section 30, and 453 acres in section 36). Commercial thinning and group selection of merchantable sized lodgepole pine would occur on all acres. Harvest prescriptions would favor the retention of ponderosa pine and western larch. Healthy Douglas-fir would also be retained to help achieve desired stocking levels but larch and pine would be favored over Douglas-fir. The reduction in Douglas-fir would increase the proportion of other species in the overstory resulting in a change in composition. Approximately 50 to 80 trees would be left per acre. Natural regeneration of ponderosa pine and western larch would be promoted in all harvested areas by scarification through harvest operations.

There will be likely a small change to cover type distribution as the result of the timber harvest. Composition of PP and WL will increase due to the removal of DF and LP. Some current lodgepole pine stands may be converted to PP or WL/DF depending on what regeneration becomes established post harvest.

Action Alternative – Cumulative Effects

The Action Alternative may result in a decrease in the acreage for the LP cover type (79 acres) and may increase in acreage of the PP cover type (79 acres). These effects would be cumulative to those of the Spencer Lake Timber Sale project which will have an increase of 181 acres in the WL/DF cover type, an increase of 16 acres in the PP cover type, a decrease of 39 acres in the MC cover type, and a decrease of 158 acres in the DF cover type. This project would have no change in age class distribution.

Distribution of Old-Growth Stands –

No Action Alternative – Direct, Indirect, and Cumulative Effects

No old growth is present in the project area. Under the No Action Alternative, stands would continue to develop under the influence of suppressed wildfire activity and other natural disturbances such as windthrow and age associated mortality. Maintenance of old-growth characteristics and defining criteria will be dependent on the persistence and the rate of mortality.

Action Alternative – Direct, Indirect, and Cumulative Effects

Under the Action Alternative, no old growth would be harvested. Tree growth and vigor would likely increase resulting in more large diameter trees per acre.

Stand Structure and Development –

No Action Alternative – Direct and Indirect Effects

Stand structure and development could continue to change as a result of damaging agents. Older stands (100-149 years +) comprising 100% of the project area are experiencing reductions in live tree canopy closure due to insect and disease caused mortality. The mosaic pattern of multi-aged and multi-storied or small even-aged patches are likely to persist with this type of disturbance, resembling the unstable conditions and stand development often associated with late successional forests. More shade tolerant species would increase in all canopy levels

continuing to replace or inhibit growth of PP and WL, as dense small diameter trees develop in the understory. Area coverage of forest in early successional stages, especially in larger patch sizes would continue to decrease. Forest fuels, both ground and vertical would continue to build up in stand areas where mortality is occurring, increasing the potential for severe, less controllable fires that may result in large scale stand replacement fires.

No Action Alternative – Cumulative Effects

Forest succession and fire suppression would continue. Conditions favoring the establishment of shade tolerant species in canopy gaps, the slow growth of seedlings and saplings under closed canopies or the hindrance of tree establishment under closed canopies, and increasing fuel loadings would continue.

Action Alternative – Direct and Indirect Effects

Under the Action Alternative, commercial thinning and group selection are proposed for 847 acres. Current stand ages and structures would remain unchanged on the majority of the acres. Areas of group selection in lodgepole pine would occur on a small percentage of the harvest acres (about %5). In the group selection areas, stand age would be reduced as well as structure. Commercial thinning would maintain some of the mid- and lower-canopy, favoring seral species and vigorous trees. These treatments would resemble mixed severity fires and act as a thinning agent, killing the less fire resistant species and releasing the more fire resistant trees, such as ponderosa pine and western larch. After slash disposal treatments are completed more fire resistant stand conditions and structures would be maintained for several decades.

Action Alternative – Cumulative Effects

There would be no change in stand structures.

Timber Productivity and Value –

No Action Alternative – Direct and Indirect Effects

Due to the effects of insects and disease the commercial value of sawlogs would continue to decline. Non-sawlog or pulp values are generally less than that received for sawlogs, and the value of this timber trust asset would continue to decline. Growth rates of individual trees in denser, older stands would remain static or begin to decline and opportunities for establishment of replacement trees would be limited to small openings favoring shade tolerant trees. Development of larger diameter commercially valuable ponderosa pine and western larch as a persistent component in the overstory of older stands would be hindered. Loss of dead and dying trees along both open and closed roads would continue to occur from activities associated with firewood gathering. The request for small-scale salvage permits would likely increase.

No Action Alternative – Cumulative Effects

Without silvicultural treatments or wildfires to control tree densities, reduce losses to insects or disease, and recover mortality or initiate new stands, the trend towards increasing acreage on the Kalispell Unit covered by older, slower growing stands that are more susceptible to beetle infestations, stem decays, or wildfires would continue.

Action Alternative – Direct and Indirect Effects

Silvicultural treatments to be applied under the Action Alternative would remove many of the shade tolerant species (mostly DF) as well as some of the mature overstory. Healthy and vigorous trees of all species would be favored for retention where they occur but would focus on leaving health ponderosa pine, western larch, and Douglas-fir. Snags and snag recruits in quantities meeting DNRC requirements would be left. Larger diameter snags and cull trees, especially shade intolerant species, if not infected with dwarf mistletoe would be favored for potential snag recruits and snag retention. Due to the removal of low vigor or diseased trees stand health would improve. Between-tree competition would be reduced

allowing residual trees to maintain or increase current growth rates. The bark beetle hazard for the treated stands will decrease due to a decrease in stocking, decadent trees, and by freeing up more available water, sunlight, and nutrients for residual trees.

Slash reduction will mainly include tree length skidding and burning of landing piles the ensuing fall. Some small diameter slash will be placed on skid trails for erosion control and nutrient cycling.

The effects for the various types of cuts as described above would occur on the treated acres. Timber productivity on the treated acres would increase or be maintained at a level closer to the site potential, improving the future opportunities for generating revenue for the trust with the use of the timber resource.

Action Alternative – Cumulative Effects

The percentage of forested land that is producing timber closer to the site potential would increase by approximately 1.5% on the Kalispell Unit. The acres of forest stands that are less susceptible to beetle infestations, stem decays, or wildfires would increase. Higher potential for greater long-term revenue from the timber resource is expected.

Sensitive Plants –

No Action Alternative – Direct and Indirect Effects

A review of the records from the MNHP for the project indicated no plant species of special concern identified within the project area. Field reconnaissance also indicated no unique or sensitive plants within the project area.

No Action Alternative – Cumulative Effects

Cumulative effects to the distribution or viability of sensitive plants populations are not expected under No Action Alternative.

Action Alternative – Direct and Indirect Effects

Since no sensitive plants are present within the project area, the Action Alternative would not have any direct or indirect effects to sensitive plants.

Action Alternative – Cumulative Effects

Since no sensitive plants are present within the project area, the Action Alternative would not have any cumulative effects to sensitive plants.

Noxious Weeds –

No Action Alternative – Direct and Indirect Effects

Weed seed would continue to be spread or be introduced throughout the project area from recreational use, residential development and use adjacent to state land or within, and commercial and non-commercial use. Herbicide treatment along open, public roads and enhancement of road closures would continue as funding and unit priorities allow. Containment of weed infestation areas or a reduction of weed infested acres may be realized.

No Action Alternative – Cumulative Effects

Cumulatively the potential spread of weed seeds and increases in areas where weed populations could start is possible under the No Action Alternative, across the Kalispell Landscape, as well. With adoption of ARM 36.11.445 and implementation of Cooperative Noxious Weed Agreements with Flathead, Lake, and Lincoln counties, a more aggressive approach to identification and treatment of noxious weeds has occurred than in the past. This ongoing treatment of noxious weeds should limit large increases in noxious weed spread and may reduce the number of acres infested in the future.

Action Alternative – Direct and Indirect Effects

Logging disturbance would increase the potential for further establishment of noxious weeds with the exposure of mineral soil in skid trails, landings, existing roads, new road construction, and road improvement sites. Applying integrated weed management techniques within the sale design would reduce the occurrences and spread of weeds. Grass seeding new and disturbed roads and landings and spot spraying new weed infestations would reduce or prevent establishment of additional populations. Washing logging equipment prior to use would limit the introduction of weed seeds into the forest. Trampling slash in skid trails and closing additional roads would limit the potential for soil disturbance within these routes during or after logging, reducing the potential for weed establishment. Treating existing weed populations along or within roads with herbicide spray would reduce current weed populations, or contain the area of infestation. This project would also likely be winter logged which would limit the exposure of mineral soil and deter new weed infestations.

Under the Action Alternative, harvesting would occur approximately 847 acres, and involve road work on approximately 7.5 miles of state roads. Acreage within harvest units are at higher risk of incurring weed establishment within the units due to soil disturbances that may occur from skidding, landing, and heavy equipment use for scarifying or fuels reduction treatments. This risk would be limited by mitigation measures described above. Enhancement of existing road closures, trampling slash in road prisms, grass seeding sites disturbed during road construction or work, and additional road closures in combination with spot herbicide treatments would reduce current coverage of weed populations and limit the potential risk of further establishment.

Action Alternative – Cumulative Effects

In combination with other management activities and recreational use of the Kalispell Landscape, the action alterative would increase the risk of further encroachment of forested sites by noxious weeds. The potential risk would be limited with the use of prevention measures implemented under County Weed plans in addition to the site-specific mitigation measures for the Bold Peak, Boorman Peak, Reid Divide, and Logan Creek timber sales. Actual treatments would likely be applied to a more extensive area under the Action Alternative, and have a greater potential for reducing current weed populations within the project area, thereby reducing the noxious weed affected area within the Kalispell Landscape.

References

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WATER RESOURCES ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the hydrologic and fisheries resources and display the anticipated effects that may result from each alternative of this proposal. During the public scoping, no issues regarding water quality or fisheries impacts were identified by the public. The following issue statements were compiled from internal discussions regarding the effects of the proposed timber harvesting.

- *Timber harvesting and road construction activities may increase sediment delivery into streams and affect water quality.*
- *Timber-harvesting activities may affect water quality and fisheries habitat by reducing shade and recruitable woody debris in the Riparian Management Zone and increasing stream temperatures.*

ANALYSIS METHOD

Sediment Delivery

The methods applied to the project area to evaluate potential direct, indirect, and cumulative effects include a field review of potential sediment sources from haul routes. Stream crossings and roads were evaluated to determine existing sources of introduced sediment. Potential sediment delivery from harvest units will be evaluated from a risk assessment. This risk assessment will use the soil information provided in the *SOILS ANALYSIS* and the results from soil monitoring on past DNRC timber sales.

Fish Habitat Parameters

Expected effects to fisheries habitat will be addressed qualitatively using the current condition as a baseline, disclosing the expected changes due to the alternatives proposed. The analysis method for woody debris recruitment will evaluate the potential reduction in available woody debris and shading due to timber-harvesting activities in the riparian management zone (RMZ) of the project area. Stream temperature will be addressed by evaluating the risk of stream temperature increases due to reduced shading from existing vegetation. Fish connectivity will not be addressed since none of the proposed actions are expected affect this variable in any way.

ANALYSIS AREA

Sediment Delivery

The analysis area for sediment delivery is the proposed harvest units and forest roads used for hauling. This includes upland sources of sediment that could result from this project. In addition, in-channel sources of sediment such as mass-wasting locations or excessive scour/deposition will be disclosed if found project area streams.

Fisheries Habitat Parameters

The analysis area for fisheries habitat parameters are the waterbodies and adjacent RMZ of Porter Creek and its tributary adjacent to the proposed harvest unit in Section 20, T27N, R23W.

WATER USES AND REGULATORY FRAMEWORK

WATER QUALITY STANDARDS

This portion of the Flathead River basin, including Lake Rogers and Porter Creek (tributary to Ashley Creek, is classified as B-1 by the DEQ, as stated in the ARM 17.30.608. Among other criteria for B-1 waters, no increases are allowed above naturally occurring levels of sediment, and minimal increases over natural turbidity. "Naturally occurring," as defined by *ARM 17.30.602* (*19*), includes conditions or materials present during runoff from developed land where all reasonable land, soil, and water

conservation practices (commonly called Best Management Practices or BMPs) have been applied. The State of Montana has adopted BMPs through its non-point source management plan (MDEQ, 2007) as the principle means of meeting the Water Quality Standards. Reasonable practices include methods, measures, or practices that protect present and reasonably anticipated beneficial uses. These practices include, but are not limited to, structural and nonstructural controls and operation and maintenance procedures. Appropriate practices may be applied before, during, or after completion of activities that could create impacts.

WATER QUALITY LIMITED WATERBODIES

The project area is within the Flathead-Stillwater TMDL planning area. Lake Rogers and Porter Creek are not identified as water quality limited water bodies on the 2012 DEQ 303(d) list.

*The **303(d)** list is compiled by DEQ as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, DEQ is required to identify water bodies that do not fully meet water quality standards, and/or where beneficial uses are threatened or impaired.*

STREAMSIDE MANAGEMENT ZONE LAW (SMZ)

All rules and regulations pertaining to the SMZ Law will be followed. An SMZ width of 100 feet is required on Class 1 and 2 streams when the slope is greater than 35 percent. An SMZ width of 50 feet is required when the slope is less than 35 percent.

FOREST MANAGEMENT RULES AND HABITAT CONSERVATION PLAN (HCP)

In 2003, DNRC drafted Administrative Rules for Forest Management. The portion of those rules applicable to watershed and hydrology resources include ARM 36.11.422 through 426 and 470 and 471. The HCP was adopted in December 2011 and all conservation commitments covered by the HCP are also to be applied to this project. All applicable rules will be implemented if they are relevant to activities proposed with this project. This includes implementing riparian management zones on all Class 1 streams to ensure adequate recruitable coarse woody debris and shade are maintained. Where applicable, channel migration zones will also be implemented.

WATER RIGHTS AND BENEFICIAL USES

Water rights for surface water exist on Rogers Lake for domestic use, fish and wildlife propagation stock watering and lawn/garden use.

Designated beneficial water uses within the project area include cold-water fisheries, aquatic life support, and recreational use in the streams, wetlands, and lakes in the surrounding area.

FISHERIES—THREATENED, ENDANGERED AND SENSITIVE SPECIES

Westslope cutthroat trout are listed as a Class-A Montana Animal Species of Concern. A Class-A designation is defined as a species or subspecies that has limited numbers and/or habitats both in Montana and elsewhere in North America, and elimination from Montana would be a significant loss to the gene pool of the species or subspecies (*Montana Fish, Wildlife and Parks, Montana Natural Heritage Program,* and *Montana Chapter American Fisheries Society Rankings*). DNRC has also identified westslope cutthroat trout as a sensitive species (*ARM 36.11.436*).

No threatened, endangered or sensitive species of fish are found in Porter Creek or its tributary; westslope cutthroat trout inhabit Lake Rogers.

EXISTING CONDITION

GENERAL DESCRIPTION

- ***Lake Rogers, Porter Creek and tributary***

Lake Rogers is a 239-acre waterbody locate in sections 29, 30 and 31 of T27N, R23W. Lake Rogers does not have a surface water outlet. According to the USGS topographic map, three streams contribute surface flow to the lake for the proposed timber harvest areas, however during extensive field reconnaissance, no connected surface water was found in these areas.

Fish species found in the lake include arctic grayling, redside shiner and westlope cutthroat trout (MFISH 2012).

Porter Creek and a Class 1 perennial tributary flow through a corner of the state parcel in section 20, T27N, R23W. Porter Creek is a tributary to Ashley Creek approximately 1.5 miles downstream after flowing through a large wetland area on private ownership. Recent (2012) electroshocking by MFWP only found eastern brook trout in Porter Creek adjacent to the DNRC managed parcels.

SEDIMENT DELIVERY

- ***Lake Rogers, Porter Creek and tributary***

Lake Rogers has two boat launch sites utilized by the public; one on northeast side and one on the northwest side. The site located on the northwest side of the lake is not a developed boat launch. This site has multiple entry sites on the lake shore and is a source of direct sediment delivery. The boat launch site on the northeast side of the lake is a developed boat launch with reduced sediment delivery due to gravel surfacing.

Because no road-stream crossings or adjacent road construction exists in any of the DNRC managed parcels, no sediment delivery was identified during field reconnaissance. However, the county maintained road at the Porter Creek crossing site is identified as a sediment delivery site due to maintenance activities.

FISH HABITAT PARAMETERS

- **Large Woody Debris**

Large woody debris recruitment to streams is important to maintain channel form and function and as a component of fish habitat. According to *ARM 36.11.425*, DNRC will establish a Riparian Management Zone (RMZ) *'…when forest management activities are proposed …on sites that are adjacent to fish bearing streams and lakes.'* One reason for the RMZs is to retain adequate levels of large woody debris recruitment to the stream channel. Site potential tree height (SPTH) is the method used to identify RMZ width according to *ARM 36.11.425 (5) and the HCP.* Data collection for site potential tree height in the project area along Porter Creek resulted in a SPTH of 90 feet.

While no quantitative woody debris data is available for the streams in the project area, woody debris was observed in adequate levels of Porter Creek and its tributary to maintain stream form and function.

Stream Temperature

No temperature data for Porter Creek or it tributary is available. Riparian canopy along Porter Creek and its tributary on DNRC managed lands is very dense and provides continuous shade for the streams throughout the day.

ENVIRONMENTAL EFFECTS

DESCRIPTION OF ALTERNATIVES

- ***No-Action Alternative***

  No timber harvesting or associated activities would occur under this alternative. Existing activities such as recreational use, individual Christmas tree harvesting, and firewood gathering would continue.

- ***Action Alternative***

  Four units totaling approximately 847 acres would be commercially harvested under this alternative. All of the proposed harvest would be an intermediate harvest that would maintain approximately 50% of the existing trees per acre. All units would be harvested using conventional ground-based equipment although approximately 30 acres may require some cable yarding. Approximate miles of road activities include:

  - 0.2 miles of new construction
  - 1.0 miles of road reclamation/abandonment
  - 7.5 miles would be maintained or have drainage improvements installed as necessary to protect water quality.

  Existing activities such as recreational use, individual Christmas tree harvesting, and firewood gathering would continue.

DIRECT AND INDIRECT EFFECTS

- ***Direct and Indirect Effects of the No-Action Alternative to Water Resources***

  Sediment Delivery

  Under this alternative, no timber harvesting or related activities would occur. The existing potential sediment sources would continue until repaired by another project or funding source.

  Fish Habitat Parameters

  - ***Large Woody Debris Recruitment***

    No reduction in recruitable large woody debris would result from the implementation of this alternative.

  - ***Stream Temperature***

    No increases in stream temperature from a reduction in stream shading would be expected under this alternative.

- ***Direct and Indirect Effects of the Action Alternative to Water Resources***

  Sediment Delivery

  Because DNRC would incorporate BMPs into the project design as required by *ARM 36.11.422 (2)* , soil types in the proposed harvest units are not highly erosive and all laws pertaining to SMZs would be followed, a low risk of sediment from timber-harvesting activities would result from the implementation of this alternative.

  Therefore, the risk of long-term adverse direct or indirect effects to water quality due or beneficial uses due to increased sediment would be low.

  Fish Habitat Parameters

Large Woody Debris Recruitment

Although no harvest is proposed within 50 feet of any Class 1 stream, approximately 1.3 acres of RMZ harvest is proposed along a tributary to Porter Creek, which is potential fish-bearing stream. The proposed harvest in the RMZ would remove up to 50 percent of the merchantable trees in the RMZ, but outside of the SMZ. While this proposal would reduce the recruitable woody debris for these reaches, a majority of the recruitable woody debris and all submerchantable vegetation would be retained. This level of harvest in the RMZ would be expected to have a low risk of adverse impacts to fish habitat.

Stream Temperature

As described in the Montana DNRC Forested Trust Lands Habitat Conservation Plan Final EIS (DNRC 2010), a no-harvest zone of 50 feet immediately adjacent to this stream type is expected to retain a level of stream shading similar to pre-harvest conditions. The RMZ buffers proposed under this alternative would maintain all of the trees within 50 feet of Class 1 streams and remove a maximum of 50 percent of the merchantable trees in the remaining RMZ width. Therefore, stream shading post-project is expected to maintain a low risk of increasing stream temperatures due to timber harvesting.

CUMULATIVE EFFECTS

- ***Cumulative Effects of the No-Action Alternative to Water Resources***

Sediment Delivery

The sediment delivery sites listed in the *EXISTING CONDITION* would remain. The existing direct sediment-delivery sources would continue until repaired by another project or funding source.

Fish Habitat Parameters

Large Woody Debris Recruitment

No reduction in recruitable large woody debris would result from the implementation of this alternative. Recruitable large woody debris would be retained at an adequate level to maintain stream form and function. Past impacts to recruitable woody debris would continue to ameliorate as existing harvest units revegetate and grow.

Stream Temperature

No increases in stream temperature from a reduction in stream shading would be expected under this alternative because no harvesting would occur.

Cumulative Effects Summary

Because no timber harvesting or associated activities would occur under this alternative, cumulative effects would be limited to the existing condition. Sediment sources would continue unless repaired under a separate project. Conditions would continue to support fish-habitat parameters and provide adequate levels of large woody debris and shade. Under this alternative, fisheries habitat quality parameters discussed in this assessment would be maintained at its current level.

Cumulative Effects of the Action Alternative to Water Resources

Sediment Delivery

The proposed timber-harvesting and road-construction activities would occur. A cumulative increase in sediment delivery as a result of timber harvesting would have a low risk of occurring because of the BMP application, lack of surface water features and no highly erosive soil types. The

sediment source at the northwestern boat launch would remain until improved or closed and road maintenance by the county road department would likely continue to result in sediment delivery to Porter Creek. As a result of the activities proposed and the mitigation measures recommended, no reduction or measurable increase in sediment delivery to water bodies in the project area would be expected from the implementation of this alternative.

Fish Habitat Parameters

- **Woody debris recruitment**

  While this project would harvest approximately 1.3 acres of timber within one SPTH of Class 1 streams, the large majority of the stands within 1 SPTH of Class 1 streams are intact. This proposal would result in low risk of adverse cumulative impacts to recruitable woody debris.

- **Stream temperature**

  Due to the limited amount of canopy removed in the RMZ of Class 1 streams, a low risk of cumulative temperature increases would result from the implementation of this alternative.

Cumulative Effects Summary

Because all timber-harvesting activities would follow BMPs as required by *ARM 36.11.422* and the direct and indirect effects would have a low risk of impacts, a low risk of additional adverse cumulative effects would be expected to occur as a result of this alternative. This expectation includes the results of a slight decrease in the recruitable woody debris in the RMZ along Class 1 streams. Because BMPs would be implemented during timber-harvesting and road-construction operations, the risk of adverse cumulative impacts to water quality and beneficial uses, including fisheries habitat, would be expected to be low.

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SOILS ANALYSIS

INTRODUCTION

This analysis is designed to disclose the existing condition of the soil resources and present the anticipated effects that may result from each alternative of this proposal. During the public scoping, no issues regarding soil impacts were identified by the public. Internally within DNRC, issue statements were developed to measure application of Forest Management Rule criteria. The following issue statements were compiled from internal discussions regarding the effects of the proposed timber harvesting:

- *Ground based harvest techniques can displace and compact soils which can adversely affect the hydrologic function, soil structure and long-term productivity of the impacted area.*

- *Removal of both coarse and fine woody material off site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.*

The project area for this proposal includes approximately 1,862 acres. Because harvesting is proposed on just a portion of the project area, the analysis area will be smaller.

REGULATORY DOCUMENTS and PAST FOREST MANAGEMENT

The project area is covered by the Forest Management Rules section of the Administrative Rules of Montana. The Forest Management Rules were generally derived from recommendations in the State Forest Land Management Plan (DNRC 1996). In addition, part of the project area is included in the recent Habitat Conservation Plan adopted by the Montana Board of Land Commissioners.

DNRC strives to maintain soil productivity by limiting detrimental cumulative soil impacts to 15 percent or less of a harvest area, as noted in the SFLMP (*DNRC, 1996*). As a recommended goal, if existing detrimental soil effects exceed 15 percent of an area, proposed harvesting should minimize any additional impacts. Harvest proposals on areas with existing soil impacts in excess of 20 percent should avoid any additional impacts and include restoration treatments, as feasible, based on site-specific evaluation and plans.

Cumulative effects from past and current forest management in the proposed harvest units are as a result of skid trails and landings. Records show evidence of harvest dating as early as the 1940's. The majority of the harvests occurred prior to 1960. Impact from skid trails and landings from this time period have been reduced through freeze-thaw cycles and root mass penetrating the soil. While many of the impacts have ameliorated over time, a skid trails are still visible in the proposed harvest units due to recreational ATV use. These skid trails do not appear to be eroding more than the surrounding un-trailed areas, but reduced tree densities and vigor is present on these areas. A list of harvesting in the project area can be found in the project file. Other forest product removals include fence posts and rails, firewood, and individual and commercial Christmas tree harvests throughout the last 85 years.

Nutrient Cycling

Coarse and fine woody debris provide a crucial component in forested environments through nutrient cycling, microbial habitat, moisture retention and protection from mineral soil erosion. (Harmon et al 1986). While coarse woody debris decays at various rates due to local climatic conditions, the advanced stages of decay contains many nutrients and holds substantial amounts of moisture for vegetation during dry periods (Larson et al. 1978, Wicklow et al. 1973). Forest management can affect the volumes of fine and coarse woody debris through timber harvesting and result in changes to the available nutrients for long term forest production. The method for quantifying the coarse woody debris is described in the *Handbook for Inventorying Downed Woody Material* (Brown, 1974)

DESCRIPTION OF ALTERNATIVES

- *No-Action Alternative*

  No timber harvesting or associated activities would occur under this alternative.

- *Action Alternative*

  Four units totaling approximately 847 acres would be commercially harvested under this alternative. All of the proposed harvest would be an intermediate harvest that would maintain approximately 50% of the existing trees per acre. All units would be harvested using conventional ground-based equipment although approximately 30 acres may require some cable yarding. Approximate miles of road activities include:

  - 0.2 miles of new construction
  - 1.0 miles of road reclamation/abandonment
  - 7.5 miles would be maintained or have drainage improvements installed as necessary to protect water quality.

Recommended Mitigation Measures and Contract Clauses

ARM 36.11.422 (2) and *(2)(a)* state that appropriate BMPs shall be determined during project design and incorporated into implementation. To ensure that the incorporated BMPs are implemented, the specific requirements would be incorporated into the DNRC Timber Sale Contract. As part of this alternative design, the following BMPs are considered appropriate and, would be implemented during harvesting operations:

1) Limit equipment operations to periods when soils are relatively dry, (less than 20 percent), frozen, or snow-covered to in order to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up.

2) On ground-based units, the logger and sale administrator would agree to a skidding plan prior to equipment operations. Skid-trail planning would identify which main trails to use and how many additional trails are needed. Trails that do not comply with BMPs (i.e. trails in draw bottoms) would not be used unless impacts can be adequately mitigated. Regardless of use, these trails may be closed with additional drainage installed, where needed, or grass-seeded to stabilize the site and control erosion.

3) Tractor skidding should be limited to slopes of less than 40 percent unless the operation can be completed without causing excessive displacement or erosion. Based on site review, short, steep slopes may require a combination of mitigation measures, such as adverse skidding to a ridge or winchline, and skidding from more moderate slopes of less than 40 percent.

4) Keep skid trails to 20 percent or less of the harvest unit acreage. Provide for drainage in skid trails and roads concurrently with operations.

5) Slash disposal: Limit the combination of disturbance and scarification to 30 to 40 percent of the harvest units. No dozer piling on slopes over 35 percent; no excavator piling on slopes over 40 percent, unless the operation can be completed without causing excessive erosion. Consider lopping and scattering or jackpot burning on the steeper slopes. Consider disturbance incurred during skidding operations to, at least, partially provide scarification for regeneration.

6) Retain 4 to 24 tons of large woody debris (depending on habitat type) and a feasible majority of all fine litter following harvesting operations. On units where whole tree harvesting is used, implement one of the following mitigations for nutrient cycling: 1) use in-woods processing equipment that leaves slash on site; 2) for whole-tree harvesting, return-skid slash and evenly distribute within the harvest area; or 3) cut tops from every third bundle of logs so that tops are dispersed as skidding progresses.

Issue Statement	Analysis Methods & Analysis Area	Existing Condition	Direct, Indirect and Cumulative Effects	
			No Action Alternative	Action Alternative
Ground based harvest techniques can displace and compact soils which can adversely affect the hydrologic function, soil structure and long-term productivity of the impacted area.	Methods for disclosing impacts include using general soil descriptions and the management limitations for each soil type. This analysis will qualitatively assess the risk of negative effects to soils from erosion, compaction, and displacement from each alternative, using insight from previously collected soils-monitoring data from over 90 DNRC postharvest monitoring projects. (DNRC, 2011). The analysis area will be the proposed harvest units and road locations.	None of the soil types in the analysis are considered to be highly erosive. Erosion factors are in the moderate range. Transects in previously entered stands found skid trail and ATV trails to impact 9 to 14 percent of the area. Impacts from past timber harvest projects on similar soils has resulted in average impacts of 12.7 percent (range of 5.3 to 26.2 percent).	No timber harvesting or associated activities would occur under this alternative. Skid trails from past harvesting would continue to recover from compaction as freeze-thaw cycles continue and vegetation root mass increases.	The action alternative would be expected to have soil impacts from compaction, displacement and erosion similar to the average from the DNRC Soil Monitoring data (DNRC, 2011) or approximately 12.7%. Cumulative effects would be managed at acceptable levels by reusing existing skid trails where appropriate. A list of mitigation measures and contract clauses are listed below that would help minimize cumulative impacts.
Removal of both coarse and fine woody material off site during timber harvest operations can reduce nutrient pools required for future forest stands and can affect the long-term productivity of the site.	Coarse woody material will be addressed by, first, disclosing existing levels from transect data collected during field reconnaissance. The transect data will be compared with scientific literature as required by ARM 36.11.414 (2). If the action alternative is selected, this assessment will assist in developing contract requirements and mitigation measures necessary to ensure post project levels of CWD adequately meet the recommendations of relevant literature, primarily Graham et al (1994). Fine woody material will be addressed solely through contract language that minimized removal (ARM 36.11.410). The analysis area will be the proposed harvest units.	A total of 19 transects were measured in the proposed harvest units. The average tons per acre was 5.0 with a minimum of 0.3 and a maximum of 21.3 tons per acre. Recommended levels for habitat types in the proposed harvest units are estimated at 5 to 13 tons per acre.	No changes to coarse woody material would result from this alternative. Coarse woody debris levels and nutrient cycling would continue as dictated by natural events.	An increase in coarse woody debris would result from the action alternative, however an overall reduction in fine material would be expected due to few trees per acre. Both fine and large woody debris would be retained for nutrient cycling for long-term soil productivity. By following research recommendations on the levels of coarse and fine material left on site, the risk of cumulative impacts to forest productivity from nutrient pool loss would be low.

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WILDLIFE ANALYSIS

INTRODUCTION

This analysis discloses the existing condition of relevant wildlife resources, and displays the anticipated effects that may result from each alternative of this proposal. Considerations and concerns raised by DNRC specialists and public comments received during initial scoping for the proposed project led to the following list of issues:

- The proposed activities could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature forest.
- The proposed activities could reduce abundance of snags and coarse woody debris, which could lower habitat quality for species that depend on these structural attributes, and could alter their ability to survive and/or reproduce.
- The proposed activities could alter grizzly bear (*Ursus arctos*) cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increase risk of human-caused bear mortality.
- The proposed activities could result in the modification of habitat preferred by Canada lynx (*Felis lynx*) and decrease the area's suitability for lynx.
- The proposed activities could reduce bald eagle nesting and perching habitats and/or disturb nesting bald eagles.
- The proposed activities could disturb and displace common loons (*Gavia immer*) from nest sites and preferred feeding areas, which could result in reduced recruitment of chicks.
- The proposed activities could decrease habitat suitability for fishers (*Martes pennanti*) by decreasing canopy cover in mature forest stands, decreasing abundance of snag and coarse woody debris, and by increasing roads, which could elevate risk of trapping mortality.
- The proposed activities could alter the structure of flammulated owl (*Otus flammeolus*) preferred habitat types, which could reduce habitat suitability for flammulated owls.
- The proposed activities could negatively affect pileated woodpecker (*Dryocopus pileatus*) habitat suitability by removing canopy cover and snags used for foraging and nesting, and by creating disturbance.
- The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, increasing roads in secure areas, and disturbing animals.

The following sections disclose the anticipated direct, indirect, and cumulative effects to these wildlife resources in the analysis area from the proposed actions. Past and current activities on all ownerships in each analysis area, as well as planned future agency actions, have been taken into account for the cumulative-effects analysis.

ANALYSIS AREA

The discussions of existing conditions and environmental effects will focus on two different spatial scales. The first will be the "project area," which consists of portions of sections 20, 30, and 31 in T27N, R23W, as well as section 36 of T27N, R24W (see TABLE W-1). The "project area," totaling 1,862 acres, surrounds the proposed timber harvest units and it is the area where all proposed new road construction would occur. Parcels range in elevation from 3,540 to 4,840 feet and contain a variety of slope aspects and wildlife habitats.

The second scale is the "cumulative effects analysis area," which refers to the surrounding landscape for assessing cumulative effects to wildlife species and their habitat. Cumulative effects were primarily analyzed on the project area and the adjacent surrounding sections. This area totals 11,706 acres. The

spatial scale of the cumulative effects analysis area (hereafter CEAA) is larger for certain species discussed and is described in the applicable section of this document. In general, CEAAs were delineated to approximate the size of a focal species' home range or to approximate a surrounding landscape in which the proposed activities could most likely have measureable cumulative effects to wildlife habitat. See FIGURE W-1- WILDLIFE ANALYSIS AREAS for a map showing the project area and CEAAs.

TABLE W-1. General description of state sections used as the project area.

Name	Legal Description	Approx. Acres	Elevation	Predominant Cover Types
Porter Creek	Sec 20, T27N R23W	632	3,540-4,840ft.	Ponderosa pine/Douglas-fir
Lake Rogers	Sec 30, T27N R23W	463	3,920-4,400 ft.	Western larch/Douglas-fir
Rogers Swamp	Sec 31, T27N R23W	129	3,920-4,080	Ponderosa pine/Western larch/Douglas-fir
Coyote Mountain	Sec 36, T27N R24W	638	3,960-4,600 ft.	Douglas-fir/Ponderosa pine/Western larch/ Lodgepole pine

ANALYSIS METHODS

DNRC attempts to promote biodiversity by taking a coarse-filter approach, which favors a mix of stand structures and compositions on state lands (*ARM 36.11.404*). Appropriate stand structures are based on ecological characteristics (e.g., landtype, habitat type, disturbance regime, unique characteristics). A coarse-filter approach assumes that if landscape patterns and processes are maintained similar to those with which the species evolved, the full complement of species would persist and biodiversity would be maintained. This coarse-filter approach supports diverse wildlife populations by managing for a variety of forest structures and compositions that approximate historic conditions across the landscape. DNRC cannot assure that the coarse-filter approach will adequately address the full range of biodiversity; therefore, DNRC also employs a fine-filter approach for threatened, endangered, and sensitive species (*ARM 36.11.406*). The fine-filter approach focuses on a single species' habitat requirements.

To assess the existing condition of the proposed project area and surrounding landscape, a variety of techniques were used. Field visits, scientific literature, DNRC's stand level inventory (SLI) data, aerial photographs, USDA Forest Service GIS data, Montana Natural Heritage Program (MNHP) data, and consultations with other professionals provided information for the following discussion and effects analysis. Specialized methodologies are discussed under the species in which they occur. Species were dismissed from further analysis if habitat did not exist in the project area or would not be modified by any alternative.

RELEVANT AGREEMENTS, LAWS, PLANS, RULES, AND REGULATIONS

Various legal documents dictate management criteria for the management of wildlife and their habitat on state lands. The documents most pertinent to this project include:

- *DNRC Forest Management Rules,*
- *DNRC Forested Trust Lands Habitat Conservation Plan*
- *Endangered Species Act*
- *Migratory Bird Treaty Act*
- *Bald and Golden Eagle Protection Act*

COARSE FILTER WILDLIFE ANALYSIS

Of the 108 mammal species found in Montana, 66 are suspected or known to occur in Flathead County (Foresman 2001). The majority of terrestrial vertebrates that were present at the time of European settlement likely still occur in the vicinity of the proposed project area. Six amphibian and seven reptile species have also been documented in Flathead County (Maxell et al. 2003) and at least 68 species of birds have been documented in the vicinity in the last 15 years (Lenard et al. 2003). Altered wildfire regimes due to fire suppression have resulted in widespread increasing tree densities and levels of shade-tolerant

species. Thus, tree species such as Douglas-fir and grand fir have become more prevalent on the landscape than they were historically. These departures from historical conditions probably benefit wildlife species that rely on shade-tolerant tree species and/or closed-canopy habitats, while negatively affecting species that rely on shade-intolerant tree species and/or open habitats. In the project area vicinity, there is a mosaic of mature and young stands, which benefit species relying on mature forests, and regenerating forests.

MATURE FORESTED HABITATS AND LANDSCAPE CONNECTIVITY

Issue: Timber harvesting could decrease forested cover, which may reduce habitat connectivity and suitability for wildlife species associated with mature forest.

Introduction

A variety of wildlife species rely on older, mature forests to meet some or all of their life history requirements. Mature forests, generally characterized by abundant large diameter trees and dense canopy cover, play an important role in providing food, shelter, breeding sites, and resting or travel corridors for certain animals. Wildlife use and/or preference of older, mature forests is species-specific; some species use this habitat exclusively, other species only temporarily or seasonally, and some species avoid mature forests altogether. Several species known to be strongly associated with mature and old forests include American marten (*Martes americana*), northern goshawk (*Accipter gentilis*), and winter wrens (*Troglodytes troglodytes*).

Forested landscapes in the western United States were historically shaped by natural disturbance events; primarily wildfire, blowdown, and pest outbreaks. Resulting broad landscape patterns were a mosaic of forest patches varying in age, composition and development. Timber harvest, like stand-replacement fire and blowdown, is a disturbance event that can create open, non-forested patches that over time develop into young, conifer forest. Patch size, age, shape, abundance, and distance to similar patches (connectivity) can be factors influencing wildlife use. The way through which patch characteristics influence wildlife use and distribution are dependent upon the particular species and its habitat requirements. Temporary non-forested openings, patches, and forest edges created by timber harvest and associated road building may be avoided by certain wildlife species adapted to mature closed-canopy forest. In contrast, other wildlife species flourish in early seral habitats created by disturbance. Under historical fire regimes, connectivity within forest types found near the project area was likely relatively high as fire differentially burned various habitats across the landscape (Fischer and Bradley 1987).

Analysis Area

Direct and indirect effects were analyzed on the 1,862 acres project area. Cumulative effects were analyzed on the surrounding sections directly adjacent to the proposed project area sections and south of US Highway 2 (CEAA = 11,706 acres, see *FIGURE W-1 – WILDLIFE ANALYSIS AREAS*). This scale of analysis would be large enough to support a diversity of species that use mature forested habitat and/or require connected forested habitats and centers evaluation of cumulative effects on those areas most likely to be affected by the proposed action.

Analysis Methods

Mature forested habitats and landscape connectivity were assessed using field evaluations, DNRC's stand level inventory (SLI) data, aerial-photograph interpretation, USDA Forest Service data (VMap 9.1.1), and Geographical Information System (GIS) analysis. Mature forested habitat was defined as forest stands with ≥40% canopy cover comprised primarily of trees >9 inches dbh. Forested stands containing trees of at least this size and density were considered adequate for providing minimal conditions necessary to facilitate movements of many wildlife species that benefit from well-connected mature forest conditions across the landscape. Road density was calculated in linear miles per square mile by dividing the number of road miles by the specified analysis area in square miles. Factors considered in the analysis include: 1) availability of mature forested habitats (≥40% canopy cover, >9 inches dbh), 2) average patch size, 3) the degree of timber harvesting, 4) open and restricted road density, and 5) the availability of potential travel corridors.

Existing Environment

The project area currently contains approximately 1,131 acres (61%) of mature stands that have a reasonably closed canopy (≥40% crown closure). Approximately 94 acres (5%) are permanently non-forested, mostly within the Coyote Mountain parcel. No stands in the project area meet the definition of old-growth (Green et al. 1992; see *VEGETATION ANALYSIS*). Portions of the proposed project area have undergone selective harvest treatments within the past 80 years (see *VEGETATION ANALYSIS*). Resulting mature forest stands within the project area have overstory canopy closure values that average between 30-60% and approximately 12 large live trees (≥15" dbh) per acre. These stands provide habitat for species adapted to more open forests or a mix of dense and open forest canopies. Small, dense patches of regenerating conifers are present (although not abundant) and interspersed throughout all of the DNRC parcels. Mature, closed-canopy stands are reasonably well-connected within the proposed project parcels except for Porter Creek, where mature stands in the northern half of the section are separated by those in the southern ¼ by dry, open, rocky slopes with scattered large tress. Average patch size of closed-canopy stands is roughly 231 acres (range 5-557 acres). Roads are prevalent within the project area, with a density of 5.5 linear miles of road per a square mile. Roads that can be legally accessed by the general public make up a smaller portion of the total roads, with a density of approximately 2.6 miles/sq. mile. Approximately 1 mile of DNRC restricted (not open for public motorized use) roads are periodically accessed by unauthorized motorized traffic from numerous points on adjacent private lands. Unauthorized ATV and jeep trails are prevalent within the project area, particularly in the Lake Rogers and Coyote Mountain parcels. The majority of restricted road miles and ATV trails within the project area are inaccessible by motor vehicles during normal winter conditions.

While mature forest connectivity within the project area is good, connectivity surrounding the project area has been reduced with past timber harvesting, housing development, and road construction on private industrial timberlands and private property. Presently, 21 percent (2,405 acres) of the CEAA is comprised of mature, closed canopy forests and 6 percent (666 acres) is permanent non-forest. Average patch size of mature forest is 65 acres (37 patches). Past timber harvesting and home/road building have converted much of the remaining acres into young forest stands or non-forest, respectively. The majority of the private industrial timberland (7,114 acres) in the CEAA has been recently harvested (<40 years) and consists of young, regenerating forest. Approximately 90 miles of roads (total density all roads = 4.9 miles/sq. mile) in the cumulative-effects analysis area, coupled with timber management and land clearing has largely reduced landscape-level connectivity of mature forest within the CEAA. Any harvesting that may be occurring on other ownerships in the CEAA could continue altering forested habitats and landscape connectivity. Across the cumulative-effects analysis area, landscape connectivity has been appreciably compromised for species requiring connected stands of mature forests.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Mature Forested Habitats and Connectivity

Under this alternative no timber harvesting activities would occur. Thus, no direct or indirect effects to mature forested habitat suitability and connectivity would be expected that could affect wildlife in the project area since: 1) no changes to existing stands would occur; 2) no appreciable changes to forest age, the distribution of forested cover, or landscape connectivity would be anticipated; and 3) no changes to wildlife use would be expected.

Direct and Indirect Effects of the Action Alternative on Mature Forested Habitats and Connectivity

Under the action alternative, harvesting would occur on approximately 847 acres. Of these acres, around 748 acres (66%) of mature closed-canopy forest stands would receive commercial thinning harvesting treatments. Treatments would retain 40-60 trees per acre, while removing diseased or suppressed/intermediate trees and all merchantable lodgepole pine. Under this silvicultural prescription, healthy seral species (e.g. western larch, ponderosa pine, and Douglas-fir) would be preferentially retained at a 20-25 foot spacing (on average). These areas could undergo harvest levels that would reduce habitat for species that rely on mature, closed-canopy forested habitats. Small, completely open patches (≤1 acre)

could be created in areas containing high amounts of merchantable lodgepole pine. Overstory crown closure on these 748 acres would be reduced from 30-60% to 25-50% depending upon the amount of lodgepole pine present. Species that rely on these mature forested habitats would experience a reduction in habitat for 20-40 years. The resulting reduction in crown closure and tree abundance would not appreciably change forest patch size and connectivity within the project area, but would reduce the overall habitat suitability of patches for interior mature forest species. The remaining 99 harvest acres within the proposed project area would likely undergo less of an appreciable change in forest structure, as they already consist of a more open canopy characteristic of historical conditions. After harvesting, the project area would continue to provide a variety of forested habitat conditions for wildlife, but the quality of these habitats would change. In general, under this alternative, habitat conditions would improve for species adapted to more open forest conditions with seral species, while reducing habitat quality for species that prefer dense, mature forest habitats.

Under the proposed Action Alternative, approximately 0.2 miles of new permanent open road would be constructed to connect two sections of existing open road. Approximately 1.2 miles of existing restricted road would be temporarily opened for commercial harvest activities. During harvest activities, up to 9.1 miles of road (open and restricted) within the project area could receive elevated traffic levels. After harvesting, 2.5 miles of existing open road would be closed to all motorized access. All temporary roads and skid trails would be reclaimed and closed to all motorized vehicles following completion of proposed activities. At the conclusion of the proposed project, open roads in the project area would be reduced from 7.8 miles (2.6 mi/sq. mile) to 5.4 miles (1.8 mi/sq. mile). Total road density within the project area would remain high at 4.1 miles/sq. mile).

Thus, minor adverse direct and indirect effects to mature forested habitat connectivity and suitability in the project area would be expected since: 1) harvesting would appreciably reduce tree density and existing cover on roughly 748 acres (66%) of existing mature stands; 2) connectivity and patch size of mature forest would not be altered, but overall habitat quality within patches would decrease with the creation of small openings and patches with <40% crown closure; and 3) although 0.2 miles of new permanent road would be constructed, long-term open road density would decrease from 2.6 miles/sq. mile to 1.8 miles/sq. mile.

Cumulative Effects of the No-Action Alternative on Mature Forested Habitats and Connectivity

Under this alternative no timber harvesting activities would occur. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected mature forest wildlife habitat in the CEAA, and other projects could affect mature forest habitat in the future. No additional cumulative effects to mature forested habitat connectivity and suitability are expected to result from the No-Action Alternative that could affect wildlife in the CEAA since: 1) no changes to existing stands would occur; 2) no further changes to the suitability of mature forested cover or connectivity would be anticipated; and 3) no changes to wildlife use would be expected.

Cumulative Effects of the Action Alternative on Mature Forested Habitats and Connectivity

Proposed harvesting would alter approximately 748 acres (31%) of mature forested habitat present within the CEAA. Past harvesting and private housing development in the CEAAs has reduced the amount of mature, forested habitats available while altering landscape connectivity. Across the CEAA, a low percentage (20%) of closed-canopy, mature forested habitats would exist. Reductions in mature, forested habitats associated with this alternative would be additive to losses associated with past harvesting activities and any ongoing activities on neighboring private lands. Habitat for forested interior species and species associated with dense, mature stands would be further reduced, and would remain low in the CEAA. After 10 to 20 years, wildlife species that use and prefer young forest stands would benefit from cumulative increases of such habitat that would be present the project area. Landscape connectivity of mature, closed-canopy forest would not be appreciably altered given the silvicultural treatments proposed and the existing condition of the surrounding forested landscape due to past activities on neighboring ownerships. Some landscape connectivity would be maintained through forest retention along streams, but connectivity of mature forest would remain low within non-DNRC parcels in the CEAA. Overall,

connectivity of young forests and mature stands with more open (<40%) crown closure would increase while connectivity of mature forested habitats would decrease in the short term. Proposed harvesting and associated activities could temporarily (up to 4 years) increase open road density within the CEAA from 1.3 miles/sq. mile to 1.4 miles/sq. mile. After project completion, long-term open road density would decrease to 1.2 miles/sq. mile. Thus, minor adverse cumulative effects to mature forested habitat suitability and connectivity for wildlife would be expected in the CEAA since: 1) harvesting would alter 748 acres (31%) of existing mature forest in the CEAA; 2) current availability of mature, closed canopy habitat would remain virtually unchanged and minor cumulative changes to wildlife use would be expected; 3) mature forest patch size, abundance, and configuration would be minimally altered, but crown closure and forest interior conditions would be reduced; and 4) the proposed decrease in long-term open road density associated with this action would not be expected to appreciably change wildlife use or alter current levels of connectivity.

SNAGS AND COARSE WOODY DEBRIS

Issue: Timber harvesting could reduce abundance of snags and coarse woody debris, which could lower habitat quality for species that depend on these structural attributes, and could alter their ability to survive and/or reproduce.

Introduction

Snags and coarse woody debris are important components of forested ecosystems. The following are 5 primary functions of snags and downed logs in forest ecosystems: 1) increase structural diversity, 2) alter the canopy microenvironment, 3) promote biological diversity, 4) provide important habitat substrate for wildlife, and 5) act as a storehouse for nutrient and organic matter recycling agents (Parks and Shaw 1996).

Snags and defective trees (e.g. partially dead, spike top, broken top) are used by a variety of wildlife species for nesting, denning, roosting, feeding, and cover. Snags and defective trees may be the most valuable individual component of Northern Rocky Mountain forests for wildlife species (Hejl and Woods 1991). The quantity, quality, and distribution of snags affect the presence and abundance of many wildlife species relying upon them. Snags provide foraging sites for insectivorous species and provide structures used by primary cavity-nesting species to excavate nests. The cavities created by primary excavators (i.e. woodpeckers) provide habitat for secondary cavity users, including other birds and small to mid-sized mammals. Snags and defective trees can also provide nesting sites for secondary cavity users where cavities are formed by broken tops and fallen limbs. Large, tall snags tend to provide nesting sites, while short snags and stumps tend to provide feeding sites (Bull et al. 1997). Many species that use small-diameter snags will also use large snags; however, the opposite is not true. Typically, old stands will have greater numbers of large snags. Finally, the density of snags is another important indicator of habitat quality for some cavity-nesting species. Species such as the black-backed woodpecker tend to nest and forage in areas where snag densities are high, using one snag for nesting and others nearby for foraging and roosting.

Coarse woody debris provides food sources, areas with stable temperatures and moisture, shelter from the environment, lookout areas, and food-storage sites for several wildlife species. Several mammals rely on downed logs and snags for survival and reproduction. The size, length, decay, and distribution of woody debris affect the capacity of various species to meet their life requisites. Single, scattered downed trees can provide lookout and travel sites for squirrels or access under the snow for small mammals and weasels, while log piles may provide foraging sites for weasels and secure areas for snowshoe hares.

Analysis Area

Direct and indirect effects were analyzed within the project area (3,144 acres). Cumulative effects were analyzed within the surrounding sections directly adjacent to the proposed project area (6,181 acres, see *FIGURE W-1 – WILDLIFE ANALYSIS AREAS)*. Wildlife species associated with snags and coarse woody debris found in the CEAA would be those most likely to be influenced by cumulative effects associated with nearby activities and proposed habitat alteration on the project area.

Analysis Methods

The abundance of snags and coarse woody debris were quantitatively estimated in the proposed project area using 24 systematically placed plots containing a single, 100-foot long sampling transect. Factors considered in the analysis included the level of proposed harvesting, past timber harvest, number of snags, and weight in tons of coarse woody debris.

Existing Environment

Within sample plots, large snags (≥21" dbh) were mostly absent (1 total snag in 24 plots) and few were observed with the proposed project area. Snags between 8" and 21" dbh were more abundant (3.6/ac, range 0-46.2) and consisted of ponderosa pine and Douglas-fir. Average snag diameter of all snags >8" dbh was 12.2" (range 8-21"). Evidence of snag use for wildlife foraging and/or cavity building was observed in all harvest units. Coarse woody debris levels were also variable across the project area, with an average of 5.5 tons per acre (range 0.3-21.3 tons per acre). Condition of coarse woody debris varied from hard to fully decayed. Average diameter of all downed wood was small (5.2"). Similar to unaltered forested landscapes, snags and downed wood resources were not distributed evenly across the project area.

Overall, snag resources exist at current levels to meet DNRC's minimum-retention thresholds. Current snag sizes are smaller than preferred, however larger snag recruits (live trees >15 inches dbh) were present in acceptable amounts at almost all plots. The lack of larger snags at all sites can be attributed to harvest history and illegal firewood gathering. Snags and coarse woody debris are frequently collected for firewood, especially near open roads, and firewood cutting occurs in the cumulative-effects analysis area. Unauthorized motorized use on DNRC parcels in the project area has facilitated the removal of larger-sized snags. Coarse woody debris levels in the project area are currently below that recommended by Graham et al. 1994 for the habitat types examined. As most of the project area parcels are adjacent to private land with home sites, urban interface post-harvest cleanup could account for some sites having lower amounts of downed wood. Outside of the proposed project area, any ongoing harvesting on other ownerships could continue to alter snags, snag recruits, and coarse woody debris levels. Snag and coarse woody debris levels on surrounding parcels likely vary widely depending on ownership, harvest and wildfire history.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Snags and Coarse Woody Debris

No direct changes in the abundance or distribution of snags and downed logs would be expected. Existing snags would continue to provide wildlife habitat, and new snags would be recruited as trees die. No direct and indirect effects would be expected to affect wildlife species requiring snags and coarse woody debris since: 1) no harvesting would occur that would alter present or future snag or coarse woody debris concentrations, 2) no changes to human access for firewood gathering would occur, and 3) no change in habitat quality would be expected that could affect wildlife species ability to survive and/or reproduce.

Direct and Indirect Effects of the Action Alternative on Snags and Coarse Woody Debris

Existing snags, live recruitment trees and coarse woody debris would be altered due to timber harvesting on 847 acres in the proposed project area. Most harvested areas would likely undergo a reduction in snags. Coarse woody debris amounts would likely remain similar to existing levels in harvest units under the proposed action. Harvest prescriptions call for retention of 2 snags, and 2 large snag recruits per acre greater than 21 inches dbh where they exist, otherwise the next largest size class; additional large-diameter recruitment trees would be left if sufficient large snags are not present, and 4 to 25 tons (depending upon habitat type) of coarse woody debris per acre retention in the proposed harvest areas. While some snags and/or recruit trees could be lost due to safety and operational concerns, replacements would be identified to comply with *ARM 36.11.411* and *LY-HB2* (USFWS and DNRC 2010, Vol. II, p. 2-48). Although current snags present in the project area are generally small diameter, ample large live trees/snag recruits exist within proposed harvest units. Future snag quality in the harvested areas would be enhanced with proposed silvicultural prescriptions that should lead to increased tree growth, larger tree diameters, and the reestablishment of shade-intolerant species such as western larch and ponderosa pine that provide high-

quality structures important for wildlife nesting and foraging. The potential future risk for snag and coarse woody debris loss due to firewood gathering would decrease with the proposed action, as long-term open road amounts would decrease by 2.3 miles. However, the abundance of private residences around the project area and newly reestablished skid trails make continued illegal firewood gathering highly likely. Additionally, legal open-road access through DNRC parcels would remain unaltered and continue to be a source of snag loss. Thus, minor adverse direct and indirect effects to snags and coarse woody debris would be anticipated that would affect habitat quality of wildlife species requiring these habitat attributes since: 1) harvesting would alter snags, snag recruitment trees, and coarse woody debris on 847 acres (45.5%), but levels of these habitat attributes in unharvested areas (54.5%) would remain unaltered; 2) snags and future recruitment trees would be retained in all proposed treatment areas; 3) open road access for firewood gathering would decrease in the long-term by 2.3 miles; and 4) minor changes in habitat quality that could impact survival and/or reproduction of species associated with dead wood would be expected.

Cumulative Effects of the No-Action Alternative on Snags and Coarse Woody Debris

Snags and coarse woody debris would not be altered in the project area under this alternative. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected snag and coarse woody debris used by wildlife in the project area, and other proposed projects could affect these habitat attributes in the future. No additional cumulative effects to habitat quality for wildlife species that utilize snags and downed woody debris are expected to result from the No-Action Alternative. Thus, no cumulative effects to wildlife associated with snags and coarse woody debris would be anticipated since: 1) no further harvesting would occur that could affect existing snag and coarse woody debris abundance; 2) no changes to human access for firewood gathering would occur, and 3) no change in habitat quality that could affect wildlife species ability to survive and/or reproduce would occur.

Cumulative Effects of the Action Alternative on Snags and Coarse Woody Debris

Some snags could be removed from the project area, whereas coarse woody debris material would remain similar or increase slightly. Lands within the CEAA have experienced different management policies through time, and snags and coarse woody debris have received different levels of consideration; in general, past harvesting on 7,114 acres (60.8% of the CEAA) has likely reduced these attributes. The reduction of snags associated with this alternative would be additive to the losses associated with past harvesting and any ongoing harvesting within the CEAA. However, the project requirements to retain 2 large snags and 2 large snag recruits per acre (greater than 21 inches dbh or next largest size class), and 4 to 25 tons of coarse woody debris per acre (depending upon habitat type) would mitigate additional cumulative effects associated with this project. Approximately 3,926 acres (33.5%) within the CEAA have not been recently harvested and likely contain moderate levels of snags and coarse woody debris. Under the Action Alternative, long-term open road amounts would decrease by 2.3 miles; thus, risk of potential loss of snags and coarse woody debris resulting from firewood gathering would decrease. However, the abundance of private residences around the project area and newly reestablished skid trails make continued illegal firewood gathering highly likely. Wildlife species that rely on snags and coarse woody debris in the CEAA would be expected to persist at similar levels, albeit slightly lower numbers in proposed units following treatment. Thus, minor adverse effects to habitat quality for wildlife requiring snags and coarse woody debris would be anticipated that would affect the survival and/or reproduction of these species in the CEAA for 30-100 years since: 1) 847 acres of the CEAA would be harvested reducing snags and snag-recruit trees while coarse woody debris levels would not appreciably change; 2) a portion of the CEAA (26.3%) would continue to provide snags and downed wood habitat attributes; 3) a minor decrease in public access and associated firewood gathering would be anticipated; and 4) there would be increased representation of shade-intolerant tree species that could become high-quality snags and downed wood in the long term.

FINE-FILTER ANALYSIS

In the fine-filter analysis, individual species of concern are evaluated. These species include those listed as threatened or endangered under the Endangered Species Act of 1973, species listed as sensitive by DNRC,

and animals managed as big game by Montana DFWP. TABLE W-2 – FINE FILTER summarizes how each species considered was included in the following analysis or removed from further consideration, since suitable habitat either did not occur within the project area or proposed activities would not affect their required habitat components.

TABLE W-2 – FINE FILTER. *Species considered in the fine-filter analysis for this proposed project.*

STATUS	**Species/Habitat**	**Determination - Basis**
Threatened & Endangered Species	Canada lynx *Habitat: subalpine fir hab. types, dense sapling, old forest, deep snow zone*	***Included*** – Potential lynx habitats occur within the project area.
	Grizzly bear *Habitat: recovery areas, security from human activity*	***Included*** – Although the proposed project area is outside of any federally designated grizzly bear recovery zones and occupied habitat as mapped by T. Wittinger (2002), Montana Fish, Wildlife and Parks has documented recent use of the area by several grizzly bears (Mace and Roberts 2011)
Sensitive species	Bald eagle *Habitat: late-successional forest <1 mile from open water*	***Included*** –An active bald eagle nest (Lake Rogers) occurs within the proposed project area.
	Black-backed woodpecker *Habitat: mature to old burned or beetle-infested forest*	***Excluded –*** Recently (less than 5 years) burned areas do not exist in the project area. Thus, no direct, indirect or cumulative effects to black-backed woodpeckers would be expected.
	Coeur d'Alene salamander *Habitat: waterfall spray zones, talus near cascading streams*	***Excluded*** – No moist talus or streamside talus habitat occurs in the project area. Thus, no direct, indirect, or cumulative effects to Coeur d'Alene salamanders would be expected.
	Columbian sharp-tailed grouse *Habitat: grassland, shrubland, riparian, agriculture*	***Excluded*** – No suitable grassland communities occur in the project area. Thus, no direct, indirect, or cumulative effects to Columbian sharp-tailed grouse would be expected.
	Common loon *Habitat: cold mountain lakes, nest in emergent vegetation*	***Included*** – A single pair of common loons has nested on Lake Rogers for at least 25 years. One proposed harvest unit is within 500 feet of Lake Rogers.
	Gray wolf *Habitat: ample big game populations,*	***Excluded*** – No known wolf packs currently occur in the vicinity of the proposed project area. No wolf den or rendezvous sites are known to occur within ½ mile of the project area. If any such sites were discovered during proposed activities, operations would be halted and a mitigation plan

	security from human activity	enacted. Effects of proposed activities on big game populations would be expected to be minimal. Close proximity to a major highway and multiple human residences discourage wolf presence within the project area. Thus, negligible direct, indirect, or cumulative effects to gray wolves would be expected.
	Fisher *Habitat: dense mature to old forest <6,000 ft. elev. and riparian*	***Included*** – Potentially suitable fisher habitat occurs within the proposed project area.
	Flammulated owl *Habitat: late-successional ponderosa pine and Doug.-fir forest*	***Included*** – Potentially suitable mature dry ponderosa pine and Douglas-fir habitats occur within the proposed project area.
	Harlequin duck *Habitat: white-water streams, boulder and cobble substrates*	***Excluded*** – No suitable high gradient streams occur in the project area. Thus, no direct, indirect, or cumulative effects to harlequin ducks would be expected.
	Northern bog lemming *Habitat: sphagnum meadows, bogs, fens with thick moss mats*	***Excluded*** – No suitable sphagnum bogs or fens occur in the project area. Thus, no direct, indirect, or cumulative effects to northern bog lemmings would be expected.
	Peregrine Falcon *Habitat: cliff features near open foraging areas and/or wetlands*	***Excluded*** – Small cliffs occur within the project area. However, no potentially suitable nest sites were observed. No nest sites have been recorded within 5 miles of the project area (MNHP 2012). Thus, no direct, indirect, or cumulative effects to peregrine falcons would be expected.
	Pileated woodpecker *Habitat: late-successional ponderosa pine and larch-fir forest*	***Included*** – Potential habitat occurs in the proposed project area.
	Townsend's big-eared bat *Habitat: caves, caverns, old mines*	***Excluded*** – DNRC is unaware of any mines or caves in the project area or close vicinity that would be suitable for use by Townsend's big-eared bats. Thus, no direct, indirect, or cumulative effects to Townsend's big-eared bats would be anticipated.
Big Game Species	Elk	***Included*** – Year-round use by deer, elk, and moose is possible. Winter range for big game species is present within the proposed project area.
	Moose	
	Mule Deer	
	White-tailed Deer	
Other Species	Red-tailed hawk	***Excluded*** – A red-tailed hawk nest with young-of-the-year was located during a field visit to the project area in 2012. This species typically lays eggs in April, with incubation lasting about a month. Young typically fledge in June or July when 6 to 7 weeks old, but still remain associated with the

		nest in late July. The nest location does not fall within any proposed harvest units, but is within ½ mile. Under the Action Alternative, timing restrictions would prohibit any commercial forest activity within ½ mile of the nest site from April 1 – July 15 and within ¼ mile from April 1 – August 15. Forest habitat within 250 feet of the nest site would remain unaltered. Thus, very low to negligible effects on nesting red-tailed hawks would be expected under the proposed action.

THREATENED AND ENDANGERED SPECIES

CANADA LYNX

Issue: The proposed activities could result in the modification of habitat preferred by Canada lynx and decrease the area's suitability for lynx.

Introduction

Canada lynx are listed as "threatened" under the Endangered Species Act. Canada lynx are associated with subalpine fir forests, generally between 4,000 to 7,000 feet in elevation in western Montana (Ruediger et al. 2000). Lynx abundance and habitat use are strongly associated with snowshoe hare populations; thus activities which decrease habitat quality for snowshoe hares can reduce the availability of prey for lynx. Lynx habitat in western Montana consists primarily of stands that provide habitat for snowshoe hares including dense, young and mature coniferous stands (Squires et al. 2010). Forest type, stem densities, natural disturbance history, and time since harvesting play important roles in shaping the suitablilty of young foraging habitat for lynx. Mature forest stands with abundant horizontal cover and coarse woody debris also provide structure important for foraging, denning, travel, and security. These conditions are found in a variety of habitat types (Pfister et al. 1977), particularly within the subalpine fir series. Historically, northwest Montana contained a variety of stand types with differing fire regimes. This variety of stand types combined with patchy elevation and snow-depth gradients preferred by lynx, likely formed a non-continuous mosiac of lynx and non-lynx habitats (Fischer and Bradley 1987, Ruggiero et. al. 1999, Squires et al. 2010). Forest management considerations for lynx include providing a mosaic of young and mature lynx habitats that are well connected across the landscape.

Analysis Areas

Direct and indirect effects were analyzed for activities conducted within the 1,862 acre project area. Cumulative effects were analyzed on a 31,072 acre CEAA generally centered on the project area. The CEAA primarily consists of portions of the Middle Ashely Creek, Little Bitteroot Lake and Little Bitteroot River-Sickler Creek HUC 12 watersheds falling south of US Highway 2 (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale of analysis approximates the home range size of a male lynx (Ruediger et al. 2000).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and Geographical Information System (GIS) analysis of DNRC's Stand Level Inventory (SLI) data and suitable lynx habitats. Suitable lynx habitat was subdivided into the following lynx habitat types: 1) winter foraging, 2) summer foraging, 3) other suitable, and 4) temporary non-habitat. Classification occurred according to DNRC HCP lynx habitat mapping protocols (USFWS and DNRC 2010) based upon a variety of vegetation characteristics important to lynx and snowshoe hares (i.e., forest habitat type, canopy cover, stand age class, stems/acre, and coarse woody debris).

Other suitable lynx habitat is defined as habitat that has the potential to provide connectivity and lower quality foraging habitat. The temporary non-habitat category consists of non-forest and open forested stands that are not expected to be used appreciably by lynx until adequate horizontal and vertical cover

develops. Factors considered in the analysis include: 1) the abundance of lynx habitat types, 2) landscape connectivity, and 3) the level of harvesting.

EXISTING ENVIRONMENT

Approximately 390 acres (21.0%) of potential lynx habitat occurs in the 1,862 acre project area. All of these acres are currently providing suitable habitat (TABLE W-3 – LYNX HABITAT). Suitable lynx habitat within the project area is defined as the sum of the summer foraging, winter foraging, and other suitable lynx habitat catagories. In the project area, winter foraging habitat is the most abundant type of suitable habitat (*TABLE W-4 – LYNX HABITAT*). Amounts of coarse woody debris were quantitativly assessed within the project area and found to be generally appropriate for the habitat types present (see SNAGS AND COARSE WOODY DEBRIS section of this analysis for further detail). Past harvesting of 78 acres (4.2%) within the proposed project area has altered lynx habitat, however all of these acres received intermediate treatments or have regenerated enough to become suitable habitat for lynx. Habitat types suitable for lynx use are only found in non-adjacent sections 20 and 31 of the project area; thus connectivity within the project area is low. Additionally, few riparian areas are present within the proposed project area that limit potential travel corridors for lynx, should they be present in the area. Throughout the project area, habitat and connectivity conditions are marginal for potential lynx use.

Canada lynx have been documented within the CEAA in the past (MNHP 2012). Land owners in the CEAA are DNRC (9%), Plum Creek Timber (57%), USDA Forest Service (15%) and various private owners (19%). Of DNRC lands within the CEAA, approximatly 724 acres (27%) are in potential lynx habitat types, all of which are currently considered suitable for lynx (*TABLE W-3 – LYNX HABITAT*). USDA vegetation data and interpretations of aerial photographs within the CEAA show approximately 2,168 acres (7%) as permenantly non-forested, 21,005 acres (68%) in early regenerating forest stands and 4,800 acres (15%) to be mature forest with a reasonably closed (>40%) canopy. Another 7,077 forested acres (10%) consist of low-elevation stands with more open overstory canopies that are not likely providing lynx habitats. USDA Forest Service lands (4,645 acres) in the CEAA likely consist of the highest-quality potential lynx habitat in the area: elevation is generally higher, average snow depth deeper, historic harvest levels were less intensive and habitat connectivity is higher. Examination of aerial photography suggests much of the CEAA (>40%) was harvested within the last 20 years, thus it is likely that most regenerating, non-mature forested stands do not provide summer foraging habitat for lynx due to low stem densities. Occupied human dwellings and open roads prevelant in low elevation areas of the CEAA (3,000-3,600 feet) further discourage periods of extended lynx use. Non-preferred cover types are prevelent in the cumulative effects analysis area. Additionally, connectivity at the cumulative effects analysis level has been compromised by widespread harvesting and road/home construction.

TABLE W-3 – LYNX HABITAT. *Estimates of current existing lynx habitat and habitat on DNRC lands in the project area and cumulative effects analysis area. Percent refers to the percent of the lynx habitat category of the total potential habitat[a] present on DNRC-managed lands.*

LYNX HABITAT CATEGORY	**Acres of lynx habitat (percent of DNRC lynx habitat)**			
	Project Area		**Cumulative Effects Analysis Area**	
	Existing	Post-Harvest	Existing	Post-Harvest
OTHER SUITABLE	0.0 (0%)	10.2 (3.5%)	44.9 (6.2%)	55.1 (7.6%)
SUMMER FORAGE	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)
TEMP NONSUITABLE	0.0 (0%)	0.0 (0%)	0.0 (0%)	0.0 (0%)

WINTER FORAGE	291.0 (100%)	280.8 (96.5%)	680.0 (93.8%)	669.8 (92.4%)
Grand Total - Suitable Lynx Habitat	291.0 (100%)	291.0 (100%)	724.9 (100%)	724.9 (100%)

[a]Total potential lynx habitat is a habitat catagory that describes all areas that are providing suitable lynx habitat now, or those likely to provide suitable habitat at some time in the future. Total potential lynx habitat is the sum of the other suitable, summer forage, temp non-suitable, and winter forage habitat categories.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Canada Lynx

Under this alternative, no changes in lynx habitat elements would be expected in the project area and landscape connectivity would not be altered. Thus, no direct or indirect effects influencing lynx habitat suitability would be expected to occur in the project area.

Direct and Indirect Effects of the Action Alternative on Canada Lynx

Approximately 12 acres (4.1%) of suitable lynx habitat would be subject to harvesting with this alternative. Activities associated with active logging operations could temporarily displace any lynx using the area for 1-4 years, although activites within lynx habitat would likely occur for <1 year. Proposed harvest prescriptions on 10.2 acres of suitable lynx habitat would decrease mature tree abundance to 20-25 trees per acre and reduce overstory crown closure to 25-50%. These 10.2 acres of suitable lynx habitats inside harvest units would be converted to other suitable habitat (TABLE W-3 – LYNX HABITAT) for the next 10-20 years. Approximately 1.5 acres of suitable lynx habitat within 50-100 feet of Porter Creek would receive a less intensive riparian management zone (RMZ) harvest treatment and remain as winter foraging lynx habitat. Where operationally feasible, existing patches of shade-tolerant regenerating and sub-mechantable conifers would be retained. The total area of these patches would not be expected to comprise more than 10% of the acres proposed for harvest. Growth of retained mature trees and patches of sapling to pole-sized conifers, combined with post-harvest conifer regeneration following harvest, would lessen the time logged stands would be "other suitable" habitat for lynx. Following proposed logging in the project area, 291 acres (100.0%) of suitable lynx habitat would remain within the project area (TABLE W-3 – LYNX HABITAT). Winter foraging habitat would decrease by 3.5%, while stands in the other suitable habitat class would increase by 3.5% (TABLE W-3 – LYNX HABITAT). Suitable lynx habitat would be retained along perrenial streams in the project area, and thus maintain existing limited levels of habitat connectivity. Changes in lynx habitat categories in the project area would not be expected to appreciably alter lynx movement patterns, should lynx be present. In the proposed harvest units, 4 to 25 tons/acre of coarse woody debris would be retained to provide horizontal cover and security structure for lynx and lynx prey. Collectively, since: 1) the amount of existing suitable lynx habitat in the project area would remain suitable, although the proportion of suitable lynx habitats would be altered slightly (3.5%, TABLE W-3 – LYNX HABITAT); 2) winter foraging lynx habitat converted to other suitable habitat would likely develop back into winter foraging habitat in the next 10 to 20 years in the project area; 3) coarse woody debris and patches of regenerating conifers would be retained to promote forest structural complexity in harvest units, expediting their growth back into higher quality lynx habitat; and 4) landscape connectivity would not be appreciably altered, but would persist at its existing low level, minor adverse direct and indirect effects to habitat suitability for Canada lynx would be expected.

Cumulative Effects of the No-Action Alternative on Canada Lynx

No appreciable change in lynx habitats would occur under this No-Action Alternative and no further changes in landscape connectivity would be anticipated. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected lynx habitat in the project area, and other proposed projects could alter lynx habitat in the future. No additional cumulative effects to suitable lynx habitat are expected to result from the No-Action Alternative that could affect lynx habitat suitability in the CEAA. Thus, no cumulative effects to lynx habitat suitability would be expected to occur.

Cumulative Effects of the Action Alternative on Canada Lynx

Under the action alternative, approximately 847 acres (2.7%) of the 31,072-acre cumulative effects analysis area would be altered by harvesting. Of these acres, harvesting would affect 11.7 acres (<0.01%) of currently suitable lynx habitat. Within the CEAA, suitable lynx habitats on DNRC lands (725 acres) would continue to persist (TABLE W-3 – LYNX HABITAT). The CEAA contains roughly 2,433 acres (8%) of mature, closed canopy (>40%) forest located above 4,000 feet in elevation that likely serve as suitable lynx habitat. Reductions in mature foraging and increases in other habitat in the proposed harvest units would not be expected to appreciably alter lynx use of the CEAA given that surrounding habitat suitability is low. Following treatments, existing connectivity of suitable lynx habitat would be maintained along Porter Creek (section 20) with adjacent mature forest in this riperian area. Existing lynx habitat on DNRC lands in the unharvested portion of the project area (279 acres) and larger cumulative effects area (725 acres) would be expected to persist in the absence of future timber harvesting or other natural disturbance that may influence lynx habitat quality. Total suitable lynx habitat within DNRC scattered lands would remain at approximately 87.6%. Modifications of lynx habitats could be possible with any management that may occur on industrial timberlands and other privately owned lands in the CEAA. Non-industrial private ownerships and housing developments in the cumulative effects area will not likely provide lynx habitat in the future. Increased levels of motorized activities associated with the action alternative could temporarily (1-4 years) displace lynx should they be present near the proposed project area and associated roads. Thus, since: 1) overall baseline habitat suitability and connectivity for lynx would remain low; 2) existing suitable lynx habitat on DNRC lands in the CEAA would remain suitable; 3) habitat connectivity within the CEAA would be minimally affected by proposed activities; 4) lynx could be temporarily (1-4 years) displaced by logging activities in the CEAA; and 5) the area of proposed harvest is extremely small compared to lynx home range size, negligible adverse cumulative effects to lynx habitat suitability would be expected as a result of proposed activities.

Grizzly Bear

Issue: The proposed activities could alter grizzly bear cover, reduce secure areas, and increase human access, which could adversely affect bears by displacing them from important habitats and/or increasing risk of human-caused bear mortality.

Introduction

Grizzly bears are generalist omnivores that use a diversity of habitats found in western Montana and are currently listed as "threatened" under the Endangered Species Act. Preferred grizzly bear habitats are meadows, riparian zones, avalanche chutes, subalpine forests, and big game winter ranges, all of which provide seasonal food sources. Within the project area, primary habitat components include meadows, riparian areas, and big game winter ranges. Primary threats to grizzly bears are related to human-bear conflicts, habituation to unnatural foods near high-risk areas, and long-term habitat loss associated with human development (Mace and Waller 1997). Forest-management activities may affect grizzly bears by altering cover and/or by increasing access to humans into secure areas by creating roads (Mace et al. 1997). These actions could lead to the displacement of grizzly bears from preferred areas and/or result in an increased risk of human-caused mortality. By developing roads and reducing forest cover, forest management activities can bring humans and bears into closer contact and/or make bears more detectable, which can increase their risk of being struck by vehicles or shot illegally. Displacing bears from preferred areas may increase their energetic costs, potentially lowering their ability to survive and/or reproduce successfully.

Analysis Areas

Direct and indirect effects were analyzed for activities conducted within the 1,862 acre project area. Cumulative effects were analyzed in a 62,144-acre area (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS) that encompasses the project area and approximates the the home range size of a female grizzly bear in northwest Montana (Mace and Roberts 2011).

Analysis Methods

Field evaluations, aerial photograph interpretation, scientific literature and GIS queries were the basis for this analysis. Grizzly bear hiding cover was considered to be forest vegetation that will hide 90% of a grizzly bear at a distance of 200 feet. Within the CEAA, open road densities were calculated using the simple linear calculation method (road length in miles divided by area in square miles). Factors considered within this cumulative effects analysis area include availability of timbered stands for hiding cover, level of human disturbance, and miles of open, restricted, and temporary roads.

EXISTING ENVIRONMENT

The proposed project area is well outside of any grizzly bear recovery zone and non-recovery occupied habitat as mapped by T. Wittinger (2002). However, Montana Fish, Wildlife and Parks biologists documented recent use of the area by several grizzly bears, including females with young (Mace and Roberts 2011). Radio tracking data indicated grizzly use of lands in and around the CEAA in 2010. There are few records of grizzly bears in the CEAA before 2010 (MNHP 2012, Mace and Roberts 2011).

Preferred bear habitats, such as avalanche chutes and berry patches, are not present in the proposed project area. Mature forest with ≥40% average crown closure is prevalent (1,131 acres, 61%) within the project area and provides cover for grizzly bears. The project area also contains scattered patches of dense regenerating conifers that currently provide additional cover and visual screening for grizzly bears. Managing human access is a major factor in management for grizzly bear habitats. Presently, open road density in the proposed project area is approximately 2.6 miles/sq. mile (simple linear calculations) and total road density is 5.5 miles/sq. mile. Roughly 6 miles of DNRC restricted roads are periodically accessed by unauthorized motorized vehicles bypassing barriers and creating illegal trails. Secure areas for grizzly bears are not present within the project area. Although grizzly bears could use the project area at any time, moderate to high levels of human presence and disturbance, adjacent home sites, and relatively unrestricted vehicular access through much of the project area likely discourage high levels of bear use, but are present as risk factors for human-grizzly bear conflicts.

Based upon open road density, low amounts of mature forest cover, and occupied human dwellings, the CEAA likely receives moderate levels of human use and associated disturbance. These factors present several increased risk factors for grizzly bears. Approximately 2,545 acres (4%) of agricultural and ranchland areas occur throughout the CEAA on private ownerships. Livestock and pets in areas of active human use increase risk for bear conflicts and resulting management actions. Forest habitats across the CEAA are a combination of age classes, ranging from recently harvested stands to mature stands. Large portions of the CEAA (~39,046 acres, 63%) have undergone recent (<30 years) intensive timber harvest, and consists of young stands with regenerating trees. Reductions in vegetative cover can lower effective bear use of habitat and render bears more vulnerable to human-caused mortality, especially along open roads (Servheen et al. 1999). Human disturbance levels and level of forest harvesting are both closely tied to road access. Open road density for the entire CEAA is approximately 1.3 miles/sq. mile and total road density is 5.1 miles/sq. mile. The high road density present in the CEAA is primarily a result of past timber management activities and private land development. Home sites, open roads, and US Highway 2 are within the CEAA; making extensive use by bears less likely and risk factors higher than on more remote USDA Forest Service and National Park Service lands in northwest Montana.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Grizzly Bears

No direct effects to grizzly bears would be expected. No changes in open-road densities or hiding cover described under existing conditions would be anticipated. No changes to the level of disturbance to grizzly bears would be anticipated. Thus, since no changes in available habitats or level of human disturbance would be anticipated, no direct or indirect effects to grizzly bear diplacement or mortality risk would be anticipated.

Direct and Indirect Effects of the Action Alternative on Grizzly Bears

Should grizzly bears be present in the area at the time of harvest operations, they could be affected by increased road traffic, noise, and human activity, and by altered amounts of hiding cover and forage resources. Proposed activities in grizzly bear habitats would reduce grizzly bear security, possibly resulting in increased stress and/or energy expenditure to endure the disturbance or to move from the area, should they be present. These disturbances would only occur during harvesting operations (1-4 years). Contract requirements would help mitigate bear-human conflict risk by specifying that contractors are not permitted to carry firearms on the work site and that unnatural attractants must kept/disposed of in a bear-resistant manner. Approximately 0.2 miles of new open road would be constructed, however this construction would facilitate the long-term closure of 2.5 miles of existing open road. The temporary opening of currently restricted roads (1.2 miles) would occur for no more than four consecutive years to minimize activity in grizzly bear habitats. Through the opening of closed roads, the proposed action would increase open road density from 2.4 miles/sq. miles to 3.1 miles/sq. miles in the short term (1-4 years); increasing potential for disturbance to grizzly bears. In balance, after harvesting the action alternative would close motorized access to roughly 2.5 miles of open road and additional 5+ miles of trails currently being used by motorized equipment illegally, thus reducing long-term risks associated with human/bear encounters. Due to the prevelance of open roads, adjacent human dwellings and associated risk factors, and lack of preferred bear habitats, extended annual use of the proposed project area is unlikely. Overall, the proposed activities would occur in areas where appreciable levels of grizzly bear use would not be anticipated and would occur during a limited time frame (1-4 years), leading to minor increased risk of disturbance and displacement of grizzly bears.

Grizzly bear hiding cover, defined as vegetation that will hide 90 percent of a grizzly bear at a distance of 200 feet, could be reduced for 5-10 years on approximately 847 acres under the Action Alternative. This reduction in cover could increase the likelihood of a bear being detected and intentionally or accidently shot, however understory vegetation along open roads would be retained where possible. Existing cover in unharvested areas would persist and overall levels of hiding cover within harvested areas would improve over time as shrub and tree regeneration proceeds. Current levels of cover in the form of brush, shrubs, and sub-merchantable trees would be retained where available and feasible. Closed roads that would be temporarly (1-4 years) opened with this alternative, as well as unauthorized access points, would be closed in a manner to discourage motorized access after the proposed harvesting. Thus, since: 1) negligible disturbance and displacement would be anticipated; 2) hiding cover would be lost in the short-term, but would be expected to recover in 10-20 years; 3) unauthorized motorized use would be reduced; and 4) short-term increases in open road densities would be anticipated, but long-term open road densities would decrease; minor adverse direct or indirect effects to grizzly bears in the project area would be expected in the short-term.

Cumulative Effects of the No-Action Alternative on Grizzly Bears

No cumulative effects to grizzly bears would be expected. No cumulative changes to the level of disturbance to grizzly bears or secure areas would be anticipated. No cumulative changes in open-road densities or hiding cover from the existing conditions would be anticipated. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected grizzly bear habitat in the project area, and other proposed projects could alter grizzly bear habitat and/or disturb bears in the future. Thus, since no additional changes in available habitats or level of human disturbance would be anticipated as a result of the No-Action Alternative, no cumulative effects to grizzly bear diplacement or effects involving mortality risk would be anticipated.

Cumulative Effects of the Action Alternative on Grizzly Bears

The increased use of road systems during the proposed project would temporarily increase human disturbance and displacement risk for grizzly bears within a portion of the CEAA, should they occur there. Proposed activities would occur in the portion of the CEAA already experiencing moderate levels of human disturbance, largely associated with open roads and private ownerships, and would be away from the more remote portions of the CEAA on USFS lands to the east that are more likely to be used by grizzly bears. Collectively, minor short-term (1-4 years) increases in human disturbance would be anticipated in the area and contract requirements would lessen risk of human-bear conflicts during active harvest operations (i.e. proper storage/disposal of unnatural attractants). Reductions in 847 acres (1.4% of CEAA) of hiding cover would be additive to the reductions from past timber harvesting (approximately 39,046 acres) as well as

more permanent land-cover changes associated with private housing developments in the CEAA. Harvesting within the last 20 years in the cumulative effects area has appreciably altered grizzly bear cover and security. However, early successional stages of vegetation occurring in harvest units could provide foraging opportunities that do not exist in some mature stands. Post-harvest, approximately 2.5 miles of currently open DNRC road and 8 miles of currently restricted roads would be closed to motorized use. While long-term open-road densities would be slightly reduced (1.28 miles/sq. mile to 1.25 miles/sq. mile); a fairly extensive road system would persist and would continue to facilitate human access (and thus risk to grizzly bears) within the CEAA. Additionally, human activities and dwellings on 2,545 acres of private, non-industrial lands have decreased bear habitat suitability and serve as a source for a number of high-risk factors for bears (i.e. pets, livestock, and garbage). Thus, since: 1) minor, short-duration (1-4 year) increases in human disturbance levels would be expected within the CEAA; 2) hiding cover would be lost in the short-term (5-10 years) on a small portion (1.4%) of the CEAA, but would be expected to recover fairly rapidly; and 3) negligible changes (<1%) in long-term open road densities would occur; minor adverse cumulative effects to grizzly bears would be expected in the short-term (1-4 years) and minimal adverse cumulative effects over the long term.

SENSITIVE SPECIES

When conducting forest-management activities, the *SFLMP* directs DNRC to give special consideration to sensitive species. These species may be sensitive to human activities, have special habitat requirements, are associated with habitats that may be altered by timber management, and/or may, if management activities result in continued adverse impacts, become listed under the *Federal Endangered Species Act*. Because sensitive species usually have specific habitat requirements, consideration of their needs serves as a useful 'fine filter' for ensuring that the primary goal of maintaining healthy and diverse forests is met. A search of the *Montana Natural Heritage Database* documented no sensitive species in the vicinity of the project area. As shown in ***TABLE W-2.***

BALD EAGLE

Issue: The proposed activities could reduce bald eagle nesting and perching habitats and/or disturb nesting bald eagles.

Introduction

Bald eagles are diurnal raptors associated with significant bodies of water, such as rivers, lakes, and coastal zones. The bald eagle diet consists primarily of fish and waterfowl, but includes carrion, mammals, and items taken from other birds of prey. In northwestern Montana, bald eagles begin the breeding process with courtship behavior and nest building in early February; the young fledge by approximately mid-August, ending the breeding process. Preferred nest-stand characteristics include large emergent trees that are within site distances of lakes and rivers and screened from disturbance by vegetation.

Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 1,862 acre project area. Cumulative effects were analyzed on the Lake Rogers bald eagle territory home range, which is a 2.5-mile radius circle extending out from the nest site (12,566 acres). This CEAA encompasses the entire project area and likely includes the areas used by the pair of eagles occupying the territory.

Analysis Methods

Effects were analyzed using a combination of field evaluations and aerial photograph interpretation within the bald eagle home range. Factors considered within this analysis include disturbance levels and availability of large, emergent trees with stout horizontal limbs for nests and perches.

Existing Condition

The project area is included in the Lake Rogers bald eagle territory and observations of eagles nesting in the vicinity have been recorded since 1985. This territory has been active since 2005 and is typically

successful at producing chicks. The aquatic habitat associated with this bald eagle territory is primarily Lake Rogers. The terrestrial habitat incorporated by the Lake Rogers bald eagle territory is a mix of coniferous forest, meadows, swamp and housing developments along the lakeshore and a combination of meadows and coniferous forests in the upland areas. Within the present home range, large emergent conifers such as ponderosa pine and western larch likely provide important nesting, roosting, and perching habitats.

Bald eagle habitat is managed at three spatial scales, according to *ARM 36.11.429*—the nest area (area within a 0.25-mile radius of the active nest tree or nest sites that have been active within five years), the primary use area (an area 0.25-0.50-miles from the nest tree), and the home range (area within 2.5 miles of all nest sites that have been active within five years). Approximately 1,862 acres of DNRC-managed lands occur within the bald eagle home range, 93 acres in the primary use area, and 63 acres in the nest site area.

Human disturbance, including timber harvesting, residential development, agricultural clearing, and various forms of recreation are potential sources of disturbance to the nesting territory. Recreational boating and houses along the shoreline of Lake Rogers likely serve as the primary sources of disturbance in this eagle territory. Human dwellings are situated along approximately 50% of Lake Rogers' shoreline. Eagles using the Lake Rogers territory are likely habituated to a great deal of disturbance, as the nest is within 300 feet of an occupied home and the lake receives high amounts of year-round recreational activity. Many large, emergent trees are available across portions of the home range, but logging in the last 100 years has likely reduced some of these trees while others have experienced mortality and are declining in quality.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Bald Eagles

No direct or indirect effects to bald eagles would be expected. Human disturbance would continue at approximately the same levels. No changes in available nesting habitats would occur. Thus, since: 1) no changes to human disturbance levels would occur; and 2) no changes in the availability of large, emergent trees would be expected; negligible direct and indirect effects would be expected to affect bald eagles using the territory.

Direct and Indirect Effects of the Action Alternative on Bald Eagles

Proposed harvesting would be carried out on approximately 847 acres (6.7%) of coniferous forest occurring within the home range of the Lake Rogers territory. All harvest units are outside of the nest site and primary use areas. No seasonal restrictions exist on any of the proposed units in the home range and they could be harvested when appropriate soil conditions are met. Should those units in the home range be harvested when the eagles are not using the nest (August 16 – February 1), activities would be expected to have minimal effects to bald eagles and any harvesting during the nesting period (February 1 – August 15) would be expected to have minor effects to bald eagles, with a gradual decrease in effects as time progresses through the nesting period. The potential for displacement would only be expected to affect eagles during the activities and not beyond. Within the home range, prescriptions call for the retention of large seral snag species and emergent trees that could be used in the future as nest or perch trees as the stands develop around these resources. No changes to human access within the primary use area would occur, thus limiting potential for introducing additional human disturbance to this territory. Thus, minor direct and indirect effects to bald eagles would be anticipated since: 1) disturbance could be elevated within the territory during operations, but the eagle pair is likely habituated to high levels of disturbance; 2) no change in human access within the project area would occur; 3) harvesting would occur on a small proportion (6.7%) of the outer home range; and 4) negligible changes in the availability of large, emergent trees would be expected.

Cumulative Effects of the No-Action Alternative on Bald Eagles

No harvesting would occur under the no-action alternative. Thus, no cumulative effects to bald eagles would be expected since: 1) no changes to human disturbance levels would occur; and 2) no changes in the availability of large, emergent trees would be expected.

Cumulative Effects of the Action Alternative on Bald Eagles

Nesting bald eagles would continue to experience varying levels of disturbance from the ongoing recreational use of the vicinity as well as disturbance associated with lakeshore developments and forest management activities on private or Forest Service lands. Additionally, new housing developments on private lands would continue to provide potential sources of disturbance to the territory. Any harvesting that may be occurring on other ownerships in the home range could continue disturbing bald eagles or modifying their habitats. Any potential disturbance and/or noise from the proposed harvesting would be additive to any of these other forms of disturbance, however no changes in bald eagle behavior would be anticipated. Emergent trees exist across ownerships in the home range and would be expected to persist at adequate levels. Thus, minor cumulative effects to affect bald eagles would be anticipated since: 1) disturbance would be elevated within the territory during harvesting operations; 2) no changes in human access within the territory would occur; and 3) negligible changes in the availability of large, emergent trees would be expected.

COMMON LOON

Issue: The proposed activities could disturb and displace common loons from nest sites and preferred feeding areas, which could result in reduced recruitment of chicks.

Introduction

The common loon is a large, aquatic bird that preys primarily on fish, but will also consume frogs, salamanders, snails, leeches, and aquatic insects. Loons are highly territorial, and typically only one pair nests on a small to mid-size lake. Nests can be located on small islands, partially submerged logs, or on floating mats of herbaceous vegetation. Loons are poorly adapted to living out of the water; therefore nests are generally located where they can slip directly from the nest into the water. Loons are sensitive to human disturbance and are usually associated with water bodies influenced by low levels of human activity. Human disturbance during the nesting and early chick-rearing period (mid-April thru mid-July) could lead to nest failures if the adults are disturbed and leave the nest unattended for even short periods of time. Adverse impacts that can affect reproduction of loons include direct loss of nesting and nursery habitat, and loss of young to avian predators such as bald eagles. However, loon reproduction can be seriously affected by recreational disturbance caused by humans (Paugh 2006, Kelly 1992, Croskery 1991, Titus and VanDruff 1981).

Analysis Area

Direct, indirect, and cumulative effects were analyzed within a 500-ft buffer of the shoreline of Lake Rogers (180 acres). Since loons are almost exclusively dependent upon water and extremely territorial, this area is likely capable of supporting 1 pair of nesting loons.

Analysis Methods

Effects were analyzed using a combination of field evaluations and aerial photograph interpretation. Factors considered include level of shoreline disturbance, relative level of recreational pressure on the lakes, and available nesting habitat.

Existing Environment

Lake Rogers is 239 acres in size and surrounded by DNRC land on three sides and private land on one side. Approximately 28 acres of private land are situated within 500 feet of the northwest portion of Lake Rogers, including roughly 1,850 feet of shoreline. Common loons have been documented nesting on Lake Rogers for at least 30 years (MNHP 2012). Historically, this lake has supported a single pair of breeding loons that typically hatches 1-2 chicks. Loons at Lake Rogers usually nest on emergent vegetation in the swampy southwest portion of the lake. Nesting loons have mixed success at fledging young, with the resident bald eagles often preying on chicks and sometimes adults.

Shoreline development and recreationalists (primarily anglers) are likely the greatest risk factors causing disturbance of breeding loons. Approximately 55% of Lake Rogers' shoreline contains private home sites and DNRC cabin lease sites. Shoreline recreation is limited to the developed half of the lake due to

swampy conditions and heavy vegetation. People fishing from boats on Lake Rogers likely disturb loons, although cooperators and volunteers (e.g. USFS, Montana Loon Society) place signage on these lakes asking recreationalists to keep their distance from nesting areas. An unimproved boat launch area exists on DNRC land in the northwest corner of the lake and likely serves as an additional source of disturbance within 1,000 feet of the loon nesting area. Given the popularity of fishing on the lake, and the location of the boat launching area, these signs likely have limited effectiveness. Despite high amounts of recreational use and disturbance, loons on Lake Rogers usually do hatch at least one chick. Thus, nesting loons on Lake Rogers are likely habituated to moderate levels of disturbance.

Environmental Effects

Direct, Indirect, and Cumulative Effects of the No-Action Alternative on Common Loons

No direct, indirect, or cumulative effects that would affect loon disturbance levels or their productivity would be expected. Past forest management projects not associated with the proposed Lake Rogers Timber Sale may have affected loons in the project area, and other proposed projects could affect loon habitat and/or disturbance levels in the future. Human disturbance along the shoreline would continue at similar levels. No changes in human access or recreational use would be anticipated. Thus, no direct, indirect, or cumulative effects to common loons would be anticipated in the project area since: 1) no changes in shoreline disturbance would be anticipated; 2) levels of human recreational use of available loon habitats would not change; and 3) no changes to available loon nesting habitat or productivity would be expected.

Direct, Indirect, and Cumulative Effects of the Action Alternative on Common Loons

Proposed harvest operations would commercially thin up to 12 acres (6.6%) of uplands within 500 feet of Lake Rogers. Proposed harvest could increase sight distances and the associated potential for disturbance to loons, however the 12 acre area already contains an open canopy and is the site of the unimproved boat launch/parking area. Limited harvesting would occur within 50 feet of Lake Rogers for approximately 700 feet, otherwise harvest units would be situated more than 150 feet from the shoreline. Thus, vegetation along the lakeshore and potential nesting habitat would not be appreciably altered. Prescribed tree retention levels would not likely affect potential nesting habitats on Lake Rogers as retention levels would be fairly high and would minimize the potential for sediment delivery to the lake. For the duration of the project, construction of permanent roads or structures and mechanized activity within 500-feet of nest sites would be restricted from April 15 to July 15 each year to protect nesting loons (*ARM 36.11.441*). No permanent roads or developments would occur within 500 feet of any known nest sites. Should a pair of loons establish a nest closer to the proposed units, additional mitigation measures would be developed prior to harvesting to minimize effects to nesting loons. Disturbance levels and recreational use of Lake Rogers associated with private land and cabin lease sites would persist. The proposed activities under this action would be additive to any future timber management within the CEAA and sources of disturbance originating from private land. Thus, minor direct, indirect, and cumulative effects to nesting common loons and chick recruitment would be anticipated since: 1) short-term disturbance would occur within 500 feet of Lake Rogers, however activities would occur outside of the nesting season and no appreciable changes in shoreline disturbance or vegetation would be anticipated; 2) no changes to available nesting habitat would be expected; 3) current levels of human recreational use within loon habitat would not appreciably change; and 4) sources of chick mortality, primarily bald eagle predation, would remain unchanged.

FISHER

Issue: The proposed activities could decrease habitat suitability for fishers by decreasing canopy cover and snag/coarse woody abundance, and by increasing risk of trapping mortality through greater road access.

Introduction

Fishers are generalist predators that prey upon a variety of small mammals and birds, as well as snowshoe hares and porcupines. They also eat carrion and seasonally available fruits and berries (Foresman 2001).

Fishers use a variety of successional stages, but are disproportionately found in low to mid elevation mature stands with dense canopies (Powell 1982, Johnson 1984, Jones 1991, Heinemeyer and Jones 1994), and they avoid openings or young forested stands (Buskirk and Powell 1994). However, some use of openings does occur for short hunting forays or if sufficient overhead cover (shrubs, saplings) is present. Fishers appear to be highly selective of stands that contain resting and denning sites and tend to use areas within 150 feet of water (Jones 1991). Resting and denning sites are found in cavities of live trees and snags, downed logs, brush piles, mistletoe brooms, squirrel and raptor nests, and holes in the ground. Forest management considerations for fisher involve maintaining legacy snags and coarse woody debris and providing for resting and denning habitats near riparian areas while maintaining travel corridors.

Analysis Areas

Direct and indirect effects were analyzed for activities conducted within the 1,862-acre project area. Cumulative effects for fisher habitat were analyzed on a 31,072 acre CEAA generally centered on the project area. The CEAA primarily consists of portions of the Middle Ashely Creek, Little Bitteroot Lake and Little Bitteroot River-Sickler Creek HUC 12 watersheds falling south of US Highway 2 (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS).

Analysis Methods

To assess potential fisher habitat and travel cover on DNRC managed lands in the cumulative effects analysis area, sawtimber stands within preferred fisher cover types (*ARM 36.11.403(60)*) below 6,000 feet in elevation with 40 percent or greater canopy closure were considered potential fisher habitat. DNRC manages preferred fisher cover types within 100 feet of Class 1 and 50 feet of Class 2 streams, so that 75 percent of the acreage (trust lands only) would be in the sawtimber size class in moderate to well-stocked density (*ARM 36.11.440(1)(b)(i)*). Fisher habitat was further divided into upland and riparian-associated areas depending upon the proximity to Class 1 and Class 2 streams (*ARM 36.11.403(15)* and *(16)*). Direct and indirect effects were analyzed using field evaluations and GIS analysis of potential habitat. Cumulative effects were analyzed using field evaluations, GIS analysis of potential habitat, and aerial photograph interpretation of potential habitat on all other lands within the CEAA. Potential suitable fisher habitat on non-DNRC lands was considered mature forest with ≥40% crown closure generally below 6,000 feet in elevation. Snags and coarse woody debris were assessed using sampling plot data, site visits and by reviewing past DNRC harvesting information. Factors considered within by this analysis include the level of harvesting, number of snags, relative amounts of coarse woody debris, and risk level of firewood harvesting and trapping mortality.

Existing Environment

The project area ranges 3,540 to 4,840 feet in elevation (*see Table W-1*). The proposed project area contains approximately 962 acres (52%) of suitable fisher habitat, of which 10 acres (1.0%) are within 100 feet of Class 1 streams and 7 acres (0.7%) within 50 feet of Class 2 streams. The remaining 945 acres (50%) is suitable upland fisher habitat. Snags and coarse woody debris were quantified at sampling plots within proposed harvest units and were generally found to be within levels recommended by Graham et al. (1994) for the habitat types present (see WILDLIFE- SNAGS AND COARSE WOODY DEBRIS). Currently there are approximately 7.6 miles of open road (2.6 miles per square mile) on the project area. Illegal firewood gathering and off-road motorized use is present throughout the project area, but most prevalent within the Lake Rogers parcel. Of open roads within the project area, only 1 mile is open year-round and it does not offer trappers convenient access to forested riparian areas. Stands within the project area that provide potential fisher habitat are densely forested patches bordered by sapling to pole-sized stands of varied density on DNRC and adjacent private industrial forest lands. Some mature forest is adjacent to suitable fisher habitat on the southern edge of section 20, while dense riparian cover occurs along Porter Creek and an unnamed tributary (class 1 streams) and offers riparian habitat connectivity to section 20. Within uplands on the project area, most of the preferred fisher cover types are moderately or well-stocked and may support the structural features necessary for use as travel habitat, but not extensive fisher use due to their small patch size and isolation.

There no historical records of fisher occurring in the project or cumulative effects areas within the last 30 years (MNHP 2012). Within the CEAA on 2,680 acres of DNRC managed lands, there are 1,705 (64%)

acres of moderately or well-stocked fisher habitat. Of these potential habitats, approximately 30 acres (1.8%) would be considered riparian fisher habitat. Approximately 18.3 miles of perennial and 34.0 miles of intermittent streams occur on lands within the CEAA. The forested areas adjacent to these streams may contribute to the total riparian fisher habitats within the CEAA, although streams in this region are sometimes found to be absent from the landscape when ground-truthed. Of these 55.4 total stream miles, approximately 190.1 acres of mature forested habitat are within 100 feet of perennial streams and 50 feet of intermittent streams, while the rest contain recently harvested or non-forested areas. Streams in harvested areas on private ownerships showed narrow strips of adjacent forest habitat, usually no wider than 200 total feet. These forested riparian strips could still provide habitat and connectivity for fishers, particularly in the form of travel corridors. Roughly 1,675 acres (5.4%) of mature (>40% canopy) forest on non-DNRC lands within the CEAA provide additional upland fisher habitats, however it is possible that some of these acres are in cover types not preferred by fishers. Including riparian and upland habitat, potential suitable fisher habitat within the CEAA totals approximately 6,505 acres (20.5%). Within the CEAA, past harvesting has influenced mature crown closure, snags and coarse woody debris levels on about 21,005 acres (67.6%). Timber harvest, residential development, and firewood gathering has reduced snag densities on adjacent lands to well below two snags per acres, and downed logs are relatively sparse and small (<10" maximum diameter). Within the cumulative effects analysis area there is a network of existing open roads (1.1 mi/sq. mile) that facilitates trapper access, although many are not plowed, which limits motorized vehicle use during typical winter conditions. Collectively, habitat suitability for fishers within the CEAA is poor.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Fishers

No change to the stands providing fisher denning and foraging habitats would be expected as no timber harvesting activities would occur under this alternative. Also, no changes in landscape connectivity would occur. Thus, since: 1) no changes to existing habitats would be anticipated; 2) landscape connectivity would not be altered; 3) no appreciable changes to canopy cover, snags, snag recruits, and coarse woody debris levels would be anticipated; and 4) no changes to human access or potential for trapping mortality would be anticipated, no direct or indirect effects associated with fisher habitat suitability would be expected in the project area.

Direct and Indirect Effects of the Action Alternative on Fishers

Approximately 457 acres of the 962 acres (47.5%) of suitable fisher habitat in the project area occurs in proposed harvest units (TABLE W-4 – FISHER HABITAT). All of these acres possess structural attributes necessary to be considered potentially suitable habitat for fishers. Approximately 455 acres of suitable upland fisher habitat within the project area harvest units would receive harvest treatments that would thin stands to 25-50% crown closure, rendering much of the area marginally suitable to temporarily unsuitable for fisher use. These 455 acres would have reduced fisher habitat suitability use for 10-25 years, until regenerating vegetation provides additional cover. Adjacent to class 1 and 2 streams, no harvesting in riparian areas would occur within 50 feet of the stream. Outside of this 50 foot buffer, up to 50% of merchantable trees by size and species would be harvested on 1.5 acres (8.8%) of existing suitable fisher riparian habitat. These 1.5 acres of class 1 riparian fisher habitat would undergo a minor reduction in habitat suitability. Approximately 15.2 acres (91.0%) of riparian fisher habitat would remain unharvested in the project area. In all areas, harvest prescriptions call for retention of 2 snags and 2 snag recruits per acre (>21 in. dbh) where they exist, otherwise the next largest size class. Also 4-25 tons of coarse woody debris per acre would be planned for retention within the proposed units. While the proposed harvest may reduce density of snags and their recruits in the near future, the sustainability of snags in the area will be maintained by retention of appreciable numbers of leave trees and snag recruitment trees. Prescriptions call for retention of large, dominant trees in the project area; further improving the development and sustainability of large snags. These large snags and trees could be a source for fisher denning and resting sites in the future as harvested stands regenerate and further develop mature stand characteristics (20-40 years). Approximately 835 acres of upland preferred fisher covertypes that currently do not provide ample structural attributes found in suitable fisher habitat would continue maturing and could provide suitable

habitat in the next 15-40 years. Proposed alterations to roads within the project area would decrease long-term open road density from 2.6 to 1.8 mi/sq. mile, reducing motorized access (along with firewood gathering/trapper accessibility) within suitable fisher habitat. As a result of these proposed road changes, fisher mortality risk due to trapping would be expected to decrease and minor reductions of snags/coarse woody debris due to firewood gathering would be anticipated. However, firewood gathering and illegal motorized access will likely persist at a lowered level due to the area's proximity to occupied home sites and open roads. Thus since: 1) harvesting would alter a minor amount of suitable riparian (9.0%) and upland (47.2%) fisher habitat in the project area, 2) minor to negligible reductions in habitat connectivity would occur and riparian fisher habitat would be maintained, 3) risk factors associated with motorized human access levels would be reduced slightly, and 4) the overall likelihood of fisher use in the project area is inherently low due to existing low habitat quality adjacent to the project area, minor adverse direct and indirect effects would be anticipated that would affect fisher habitat suitability in the project area.

TABLE W-4 – FISHER HABITAT. *Estimates of existing and post-harvest acreages of fisher habitat within the project area and cumulative effects analysis area. Values in parentheses refer to the percentage of the fisher habitat in a category of the total area within the corresponding analysis area.*

Fisher Habitat Category	Existing		Post-Harvest	
	Project	CEAA	Project	CEAA
	1,862 acres	31,072 acres	1,862 acres	31,072 acres
Upland Fisher Habitat (DNRC)	946 (50.8%)	1,675 (5.4%)	491 (26.4%)	1,221 (3.9%)
Upland Fisher Habitat (non-DNRC)	0 (0%)	4,640 (14.9%)	0 (0%)	4,640 (14.9%)
Riparian Fisher Habitat (DNRC)	17 (0.9%)	30 (0.1%)	15 (0.8%)	29 (0.1%)
Riparian Fisher Habitat (non-DNRC)	0 (0%)	160 (0.5%)	0 (0%)	160 (0.5%)
Total Suitable Fisher Habitat (DNRC)	962 (51.7%)	1,705 (5.5%)	506 (27.2%)	1,248 (4%)
Total Suitable Fisher Habitat (DNRC lands & non-DNRC lands)	962 (51.7%)	6,505 (20.9%)	507 (27.2%)	6,050 (19.5%)

Cumulative Effects of the No-Action Alternative on Fishers

No effects to riparian or upland fisher habitats on DNRC-managed lands would be expected as no timber harvesting activities would occur under the No-Action alternative. Also, no changes to landscape connectivity within the cumulative effects analysis area would be expected. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected fisher habitat in the project area, and other proposed projects could alter fisher habitat suitability in the future. No additional cumulative effects are expected to result from the No-Action Alternative that could affect fisher habitat suitability in the CEAA. Thus, no further cumulative effects to fisher habitat suitability would be anticipated in the cumulative effects analysis area since: 1) no changes to existing habitats on DNRC ownership would occur; 2) landscape connectivity afforded by the stands on DNRC ownership would not change; 3) no changes to canopy cover, snags, snag recruits, or coarse woody debris levels would be expected; and 4) no changes to human access or potential for trapping mortality would be anticipated.

Cumulative Effects of the Action Alternative on Fishers

Approximately 457 acres (26.6%) of 6,505 acres of suitable fisher habitat in the 31,072-acre CEAA would be harvested (TABLE W-4 – FISHER HABITAT). Of these proposed acres, 1.5 (0.8%) of 190 acres of suitable fisher riparian habitat would undergo limited selective harvest. These reductions in habitat suitability would be additive to the losses associated with past and current timber harvesting in the CEAA (21,005 acres, 67.6%). Future harvest operations on non-DNRC ownerships could affect fisher habitat on the larger landscape. Approximately 6,050 acres of the 31,072-acre cumulative effects analysis area (19.5%) would remain as suitable habitat (TABLE W-4 – FISHER HABITAT). Negligible reductions in landscape connectivity within the cumulative effects analysis area would occur; existing mature forest stands along riparian areas and in upland area would persist. Motorized access and potential trapping mortality/firewood gathering would be slightly reduced with the closure of 2.5 miles of open roads following treatments; reducing open road density from 1.14 mi/sq. mile to 1.09 mi/sq. mile. Thus, minor adverse cumulative effects would be anticipated that would affect fisher habitat suitability within the

CEAA since: 1) harvesting would alter tree density and structure in stands over 26.6% of suitable fisher habitat within the CEAA, 2) minor changes to fisher habitat associated with the riparian areas (0.8%) in the CEAA would be anticipated, 3) negligible reductions in landscape connectivity for fishers would be anticipated, 4) motorized public access and associated risk factors for fishers would be slightly reduced, and 5) the overall likelihood of fisher use in the project area is inherently low due to existing low habitat quality and intensive timber management on private timberlands within the CEAA.

Flammulated Owl

Issue: The proposed activities could alter the structure of flammulated owl preferred habitat types, which could reduce habitat suitability for flammulated owls.

Introduction

Flammulated owls are small insectivorous species that is migratory and inhabits old, open stands of warm-dry ponderosa pine and cool-dry Douglas-fir forests in the western United States (McCallum 1994). Flammulated owls are secondary cavity nesters, typically nesting in 12 to 25 inch dbh aspen, ponderosa pine, or Douglas-fir cavities excavated by pileated woodpeckers or northern flickers *(Colaptes auratus)*. Forest management considerations for flammulated owls include providing open, dry stands of ponderosa pine and Douglas-fir with scattered dense sapling thickets, and retaining snags for nesting.

Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 1,862-acre project area. Cumulative effects were analyzed on the surrounding sections directly adjacent to the proposed project area sections and south of US Highway 2 (CEAA = 11,706 acres, see *FIGURE W-1 – WILDLIFE ANALYSIS AREAS)*. This scale includes sufficient area to support multiple pairs of flammulated owls if ample suitable habitat is present (McCallum 1994).

Analysis Methods

Analysis methods include field evaluations, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred flammulated owl habitat types (*ARM 36.11.403(28*)). Snags were assessed during site visits using 24 systematically placed plots in the proposed project area and reviewing past DNRC harvesting information. Canopy cover, trees/acre, and cover type were considered in the analysis of flammulated owl habitat availability and structure. Factors considered in the analysis include: 1) the degree of harvesting, and 2) the availability and structure of flammulated owl preferred habitats.

Existing Environment

The stands in the project area are largely Douglas-fir, western larch, and ponderosa pine. Within the project area there are approximately 1,395 acres (75%) of potential flammulated owl habitats. Of these potential acres, most (1,063 acres, 76%) currently contain moderately dense, closed-canopy forest likely unsuitable for foraging owls. The current conditions may be partially a result of the encroachment by shade-tolerant species and past fire suppression. Site-specific growing conditions, past timber harvest, and widespread firewood gathering have also influenced the abundance and distribution of flammulated owl habitat and large snags within the proposed project area. Approximately 332 acres (34%) of flammulated owl preferred habitat types contain more open canopies (<40%) and large mature trees characteristic of habitats used by owls. During field visits, approximately 3.5 variably spaced snags per acre were observed in the project area, however snag diameters were generally too small (average 12.2" dbh) to be suitable for nesting flammulated owls. Vegetation plots (n=24) within proposed harvest units located two snags in the ≥21" dbh class and two snags >15" dbh. Although their abundance was not captured in vegetation plots, additional snags over 21" dbh were observed in the project area. Snags exhibited a large range of decay classes. Small snag sizes and low abundance could be partially attributed to illegal access and firewood

gathering within the proposed project area. Because of these factors, overall habitat suitability for flammulated owls is low.

In the CEAA, a portion of the area (456 acres, 4%) exists in relatively open forested conditions (<40% crown closure) with mature conifers, which are primarily the result of recent forest management and timber harvesting activities. Additional acres of foraging habitat may be located within private industrial timberlands, depending on the cover type and size of retained trees. Largely, these areas are not currently useful for flammulated owl nesting (due to unsuitable cover types and/or snag limitations), but may serve as foraging habitats. There are no records of flammulated owls occurring within the CEAA for the last 30 years (MNHP 2012), although formal surveys for this secretive nocturnal species are likely lacking. Modern fire suppression has allowed conifer in-growth to create denser stands of mixed ponderosa pine, western larch, and Douglas-fir in portions of the CEAA, which has reduced habitat quality for flammulated owls. Suitable flammulated owl habitat within the CEAA is primarily limited by the abundance of dense forested conditions and intensive timber harvesting. Currently, habitat suitability for flammulated owls within the CEAA is low.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Flammulated Owls

None of the proposed forest management activities would occur. Timber harvest would not occur in flammulated owl habitat on lands in the project area. Thus, since there would be no change in availability or structure of preferred flammulated owl habitats, no direct or indirect effects to habitat suitability for flammulated owls would be anticipated as a result of the No-Action Alternative.

Direct and Indirect Effects of the Action Alternative on Flammulated Owls

Under the Action Alternative, harvesting would occur on 830 of the 1,395 acres (60%) of preferred flammulated owl cover types available in the project area. The proposed activities on suitable flammulated owl cover types would open stands to 25% to 50% canopy cover, improving stand structure suitability for flammulated owls in harvest units. Additionally, the proposed harvest prescription would favor leaving large diameter ponderosa pine, Douglas-fir and western larch, which would create habitat conditions more favorable for flammulated owls. Some snags could be removed by the proposed harvest, but at least 2 large snag and 2 large snag recruitment tree per acre (>21 inches dbh, or largest available) would be retained (*ARM 36.11.411*). Flammulated owls are tolerant of human disturbance (McCallum 1994), however disturbance associated with harvesting could temporarily (1-4 years) displace flammulated owls should they be present in the project area. Flammulated owls would not be displaced by activities occurring in the winter months when the birds have migrated to their winter range. Thus, minor beneficial direct and indirect effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative since: 1) no change in the availability of preferred flammulated owl habitat would occur, 2) proposed harvesting would alter 60% of existing suitable cover types, 3) changes in forest structure and cover type caused by harvesting would generally increase flammulated owl habitat suitability, and 4) harvest activities could temporarily (1-4 years) displace flammulated owls, should any be present in the area.

Cumulative Effects of the No-Action Alternative on Flammulated Owls

None of the proposed forest management activities would occur. Flammulated owl habitat availability and structure would remain the same in the project area, but may change on some DNRC lands and other ownerships in the CEAA as a result of other projects. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected flammulated owl habitat in the project area, and other proposed projects could alter flammulated owl habitat in the future. Thus, since no additional change in the availability or structure of preferred flammulated owl habitats would occur, no cumulative effects to habitat suitability for flammulated owls would be anticipated as a result of the No-Action Alternative.

Cumulative Effects of the Action Alternative on Flammulated Owls

Timber harvest would occur on 830 acres of suitable flammulated owl cover types in the CEAA. The proposed activities would open stands to 25% to 50% canopy cover, improving the suitability of stand structure for flammulated owls in harvest units. The improved stand structure on these 830 acres would be additive to 456 acres currently providing open forest conditions within the CEAA. Additionally, the proposed harvest prescription would favor leaving large diameter ponderosa pine, Douglas-fir and western larch, which would create habitat conditions more favorable for flammulated owls. Some snags could be removed by the proposed harvest, but at least 2 large snag and 2 large snag recruitment trees per acre (>21 inches dbh, or largest available) would be retained (*ARM 36.11.411*). Intensive timber management would be expected to continue to limit potential flammulated owl habitat on private lands within the CEAA. Flammulated owls are tolerant of human disturbance (McCallum 1994), however disturbance associated with harvesting could temporarily (1-4 years) displace flammulated owls should they be present in the project area. Flammulated owls would not be displaced by activities occurring in the winter months when the birds have migrated to their winter range. Thus, minor beneficial direct and indirect effects to flammulated owl habitat suitability would be anticipated as a result of the Action Alternative since: 1) no change in the availability of preferred flammulated owl habitats would occur, and 2) changes in structure and cover type would generally increase flammulated owl habitat suitability.

PILEATED WOODPECKER

Issue: The proposed activities could negatively affect pileated woodpecker habitat suitability by removing canopy cover and snags used for foraging and nesting, and by creating disturbance.

Introduction

Pileated woodpeckers play an important ecological role by excavating cavities that are used in subsequent years by many other species of birds and mammals. Pileated woodpeckers excavate the largest cavities of

any woodpecker. Preferred nest trees are western larch, ponderosa pine, cottonwood, and quaking aspen, usually 20 inches dbh and larger. Pileated woodpeckers primarily eat carpenter ants, which inhabit large downed logs, stumps, and snags. Aney and McClelland (1985) described pileated nesting habitat as "stands of 50 to 100 contiguous acres, generally below 5,000 feet in elevation with basal areas of 100 to 125 square feet per acre and a relatively closed canopy." Necessary feeding and nesting habitat attributes, include large snags, large decayed trees, and downed wood, which closely tie these woodpeckers to mature forests with late-successional characteristics. The density of pileated woodpeckers is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979).

Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 1,862-acre project area. Cumulative effects were analyzed on the surrounding sections directly adjacent to the proposed project area sections and south of US Highway 2 (CEAA = 11,706 acres, see *FIGURE W-1 – WILDLIFE ANALYSIS AREAS)*. This scale includes enough area to support multiple pairs of pileated woodpeckers if enough suitable habitat is present (Bull and Jackson 1995).

Analysis Methods

Analysis methods include field evaluation, aerial photograph interpretation, and GIS analysis of available habitats. SLI data were used to identify preferred pileated woodpecker habitat (*ARM 36.11.403(58)*). Direct and indirect effects as well as cumulative effects were analyzed using a combination of field evaluation, aerial photograph interpretation, Forest Service GIS data, and mapped potential habitat. To assess potential pileated woodpecker habitat on DNRC managed lands in the cumulative effects analysis area, sawtimber stands ≥100 years old within preferred pileated cover types (*ARM 36.11.403(58)*) with 40 percent or greater canopy closure were considered potential pileated woodpecker habitat. Factors considered included the amount of potential habitat, degree of harvesting, and the amount of continuous mature forested habitat.

Existing Conditions

In the project area, there are approximately 719 acres (38.6%) of potential pileated woodpecker habitat. Current potential pileated habitat consists of mature ponderosa pine, western larch and Douglas-fir stands in five separate patches. Of these patches, 1 out of the 5 stands is part of a larger suitable pileated habitat patches outside of the project area. Past harvesting has altered mature stands, snags, and coarse woody debris on roughly 78 acres (4%) of the project area. Open roads (7.7 miles) and illegal motorized use of trails/restricted roads have facilitated firewood gathering, resulting in a reduction of snags and downed logs valuable as woodpecker nesting and foraging substrates within most of the project area. Very few large snags and coarse woody debris occur in the project area (see SNAGS AND COARSE WOODY DEBRIS), however an adult pileated woodpecker was observed foraging during a field visit in June 2012. Given these observed existing habitat conditions, pileated woodpecker habitat suitability is currently moderate within the project area.

The CEAA contains approximately 783 acres (6.7%) of potential pileated woodpecker habitat on DNRC lands. An additional 1,621 acres (13.8%) of mature forest habitat are present on non-DNRC lands within CEAA and could be providing habitat conditions preferred by pileated woodpeckers. Presently, 80 percent (9,301 acres) of the CEAA is not suitable for use by pileated woodpeckers due to permanent non-forested areas (e.g. meadows, lakes), road building and recent past harvesting. Most of the remaining acres within the CEAA consist of young, dense, forested stands and/or less preferred cover types that are not likely providing habitat for pileated woodpeckers, should any be using the area. Thus, habitat quality and availability within the CEAA is currently low to moderate.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Pileated Woodpeckers

No timber harvesting activities would occur under this alternative. Thus, no adverse direct and indirect effects associated with disturbance levels or habitat suitability for pileated woodpeckers in the project area would be expected since: 1) no changes in the amount of continuously forested habitat would be

anticipated, 2) no changes to existing pileated woodpecker habitat would be anticipated, and 3) no additional disturbance would take place.

Direct and Indirect Effects of the Action Alternative on Pileated Woodpeckers

Approximately 224 acres (31.1%) of available potential pileated woodpecker habitat in the project area would be altered with commercial thinning harvest treatments. Approximately 559 acres of suitable pileated habitat would remain unharvested within the project area. Harvesting on suitable pileated woodpecker habitat within the project area would reduce forested crown closure and create stands with more widely scattered mature trees. In the stands proposed for treatment, habitat suitability for pileated woodpeckers would be reduced. Snags important for nesting pileated woodpeckers would be retained in the proposed harvest areas (see SNAGS AND COARSE WOODY DEBRIS), however the abundance of snags and snag recruitment trees would be reduced. Since pileated woodpecker density is positively correlated with the amount of dead and/or dying wood in a stand (McClelland 1979), pileated woodpecker habitat quality in the project area would be expected to be reduced. Overall patch size of contiguous pileated habitat would not be altered, however 224 acres would have lower habitat quality than unharvested areas. Silvicultural prescriptions in harvest units would retain large, healthy ponderosa pine, western larch and Douglas-fir while promoting the regeneration of many of these same species, which would benefit pileated woodpeckers in the future by providing high-quality nesting, roosting, and foraging habitats. Low-quality patches associated shade-tolerant tree species would likely be converted to a more desirable forest type, although it would take about 50-80 years to mature into pileated habitat. Pileated woodpeckers tend to be tolerant of human-caused disturbance (Bull and Jackson 1995), but they could be temporarily displaced by the noise and activity associated with the proposed harvesting. Approximately 2.5 miles of open roads would be closed to public motorized use, which would decrease current levels of firewood gathering.

Thus, minor adverse direct and indirect effects would be anticipated that would affect pileated woodpeckers in the project area since: 1) 31.1 percent of available suitable habitat would be harvested; 2) the amount of contiguous suitable pileated woodpecker habitat would not be reduced, but habitat quality would be lowered; 3) some snags and snag recruits would be removed, however, mitigation measures to retain a minimum of 2 snags per acre and 2 snag recruits per acre in harvest areas would be included; 4) harvest prescriptions would retain and promote seral tree species in all proposed harvest areas; 5) temporary levels of potential disturbance would increase, but long-term disturbance would be unchanged; and 6) firewood gathering would be reduced through the closure of 2.5 miles of open roads.

Cumulative Effects of the No-Action Alternative on Pileated Woodpeckers

No timber harvesting activities would occur under this alternative. Past and ongoing forest management projects not associated with the proposed Lake Rogers have affected pileated woodpecker habitat in the project area, and other proposed projects could disturb pileated woodpecker and/or alter habitat suitability in the future. No additional cumulative effects to pileated woodpeckers associated with disturbance risk or habitat suitability are expected to result from the No-Action Alternative that could affect pileated woodpeckers in the CEAA since: 1) no changes in the amount of continuously forested habitat would be anticipated, 2) no changes to existing pileated woodpecker habitat would be anticipated, and 3) no additional disturbance would take place.

Cumulative Effects of the Action Alternative on Pileated Woodpeckers

Under this alternative, pileated woodpecker habitat suitability would be reduced on 224 acres (28.5%) of the 783 acres existing in the CEAA. Forest canopy and tree densities on these 224 acres would still support pileated woodpecker use, however habitat would be of lower quality than the unharvested 559 acres of potential habitat. Snags, coarse woody debris, and potential nesting trees would be retained in the project area according to forest management *ARM 36.11.41*; however, snags and snag recruitment trees would be reduced from existing levels in all of the proposed harvest units. Recent harvesting on 7,114 acres (60.8%) the CEAA has reduced the quality and abundance of pileated woodpecker habitat; reductions associated with this action alternative would be additive to those reductions. The overall habitat suitability of the CEAA for pileated woodpeckers would be expected to change by a minor amount. Despite the closure of 2.5 miles of open road and illegal ATV trails, firewood gathering along open roads would continue to limit

the abundance of snags and woody debris within certain areas of the CEAA. In the long term, the retention of fire-tolerant seral species and maturation of stands across the CEAA would increase suitable pileated woodpecker habitats through time. Thus, minor cumulative effects to habitat suitability for pileated woodpeckers would be anticipated since: 1) a moderate amount (28.5%) of suitable pileated woodpecker habitat currently present within the CEAA would be altered; 2) existing baseline level of pileated woodpecker habitat suitability outside of DNRC lands is low; 3) some snags and snag recruits per acre would be removed in the proposed harvest areas for operational and human safety purposes; however, mitigation measures would retain 2 large snags and 2 large recruitment trees in harvested areas; and 4) disturbance and firewood gathering would not appreciably change in the long-term.

BIG GAME

Issue: The proposed activities could reduce habitat quality for big game, especially during the fall hunting and winter seasons, by removing forest cover, increasing roads in secure areas, and disturbing animals.

Introduction

Timber harvesting can increase big game (e.g. elk) vulnerability by changing the size, structure, juxtaposition, and accessibility of areas that provide security during times of hunting pressure (Hillis et al. 1991). As visibility and accessibility increase within forested landscapes, elk and deer have a greater probability of being observed and, subsequently, harvested by hunters. Because the female segments of the elk and deer populations are normally regulated carefully during hunting seasons, primary concerns are related to a substantial reduction of the male segment and resulting decrease in hunter opportunity. Large (≥ 250 acres) heavily forested patches at least ½ mile from an open road that would limit visibility of elk (and subsequently deer) and hunter accessibility (Hillis et al. 1991) are considered security cover. Hillis et al. (1991) also recommended that >30% of a fall elk herd home range area should contain cover patches meeting these criteria to provide adequate security for elk. It is expected that when elk security is substantially compromised, effects to deer can also be expected (albeit to a lesser degree than for elk). Timber harvesting can affect big game and habitat quality through disturbance during harvest activities, removal of forest crown closure, and by creating openings in the forest used for foraging. Forested habitat on winter ranges enables big game survival by minimizing the effects of severe winter weather conditions. Winter ranges tend to be areas confined to lower elevations that support concentrations of big game, which are widely distributed during the remainder of the year. Suitable winter ranges have adequate midstory and overstory cover that reduces wind velocity and intercepts snow, while moderating ambient temperatures. Besides providing a moderated climate, the snow-intercept capacity effectively lowers snow depths, which enables big game movement and access to forage. Snow depths differentially affect big game; deer are most affected, followed by elk, then moose.

Analysis Area

Direct and indirect effects were analyzed for activities conducted within the 1,862-acre project area. Cumulative effects were analyzed on a 62,144 acre CEAA (see FIGURE W-1 – WILDLIFE ANALYSIS AREAS). This scale of analysis approximates an area capable of supporting an elk herd home range in fall.

Analysis Methods

To assess big game habitat on the project area, SLI data were used to identify stands with cover types and forest structure (≥40 crown closure) that could provide thermal and/or hiding cover for big game species. Direct, indirect, and cumulative effects were analyzed using a combination of field evaluation, aerial photograph interpretation, and a GIS analysis of available habitats.

To determine levels of elk security habitat, existing open roads were buffered 0.5 mile and those areas identified as areas not meeting elk security habitat criteria (Hillis et al. 1991). Within the cumulative effects analysis area, recent timber harvest activities and permanent non-forest openings (i.e. lakes, rock scree) were taken into account as they likely reduce the amount of secure habitat for elk. Additionally, elk security habitat patches need to be large forested blocks (>250 acres) with adequate cover (≥40% crown

closure) to afford elk security during the general big game hunting season, so areas failing to meet this criteria were also removed, leaving patches that were distant enough from open roads, were large enough to meet the minimum acreage criteria, and had adequate forest cover density to provide elk security habitat (Hillis et al. 1991).

Factors considered in the analysis include the amount of security and winter range habitat available, the extent of past and proposed harvesting, and level of human access for recreational hunting.

Existing Environment

Portions of the proposed project area have been identified by DFWP as white-tailed deer, mule deer, moose and elk winter range. Within the project area, there are approximately 1,862 acres (100%) of white-tailed deer and moose winter range. The project area contains approximately 1,131 acres (60.8%) of habitat that are currently providing year-round cover and visual screening for big game. These acres also provide moderate to high amounts of thermal cover and snow intercept for wintering big game. Approximately 253 acres of elk security habitat (as defined by Hillis et al. 1991) are present in the project area. Evidence of summer white-tailed deer and elk use was observed during field visits. Due to past forest management and site-specific growing limitations, 399 acres (22.4%) of the project area have forested stands that are too open to be considered high-quality thermal cover or cover that would provide appreciable intercept snow. However, existing patches of scattered, dense conifer regeneration supply limited (<10% of area) additional cover capable of ameliorating the influences of cold and snow.

The project area is accessed relatively easily by adjacent landowners and cabin leasees bypassing established barriers and creating trails into the parcels. Motorized access to the parcels is also possible through a sizable network of roads that occur on neighboring industrial forest lands. Open road density is 2.6 miles/sq. mile and total road density is 5.5 miles/square mile within the proposed project area. Most restricted roads within the project area show evidence of periodic unauthorized motorized use. Moderate amounts of non-motorized human disturbance are also present, primarily during hunting season.

Approximately 44,047 (70.9%) and 62,061 acres (99.9%) of the CEAA were identified as white-tailed deer and moose winter range, respectively. Presently, approximately 12,193 acres (19.6%) of mature forest within the CEAA are providing usable thermal cover and snow intercept for big game. The majority of these forest patches are currently distributed on higher elevation Forest Service lands within the CEAA, where they may not provide benefits to wintering white-tailed deer. In the last 30 years, harvesting has reduced thermal cover and snow intercept on 24,766 acres (56.2%) of white-tailed winter range within the CEAA. These recent harvests have reduced the quality and quantity of usable cover on winter range within the area, but they may have increased forage quality and quantity by opening up the forest overstory canopy. However, forage occurring in forest openings is often not available to wintering animals during appreciable portions of the winter due to deep, crusted snow conditions. Encroachment of noxious weeds into recently logged areas has also likely offset some of the potential gain in forage production. Ongoing and future harvesting could continue to reduce cover attributes on winter range and temporarily displace big game within the CEAA.

Environmental Effects

Direct and Indirect Effects of the No-Action Alternative on Big Game Habitat

No changes in big game habitat would be expected as no timber harvesting activities would occur. Existing cover would continue to contribute to winter range quality and security habitat would not be altered. Thus, no direct or indirect effects to big game habitat in the project area would be anticipated since: 1) no changes to existing thermal cover would be anticipated and continued maturation of forest cover would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

Direct and Indirect Effects of the Action Alternative on Big Game Habitat

Under the action alternative, approximately 847 acres (45.5%) of big game habitat would undergo harvesting. Of these acres, 748 acres (66.1%) of mature forest providing thermal cover could be altered, although commercial thinning harvest prescriptions would result in some areas with continued thermal cover characteristics (retention of many large trees/dense patches of regenerated or pole-sized trees). In larger openings created by harvesting of lodgepole pine, forest vegetation capable of providing thermal cover/snow intercept would require 40-60 years for suitable sized trees (>40 ft. tall) to develop. Elk security habitat would not be harvested or affected by proposed road building. Motorized activities during harvest operations could temporarily displace big game, should they be using the area. Some short-term (1-4 years) displacement of big game would be expected as a result of the proposed motorized logging disturbance. Post-harvest, approximately 2.5 miles of currently open DNRC road and 8 miles of currently restricted roads would be closed to motorized use. During all phases of the project, any roads opened with project activities would be restricted to the general public and closed after completion of project activities. Overall, winter range quality would decrease due to removal of vegetation currently serving as thermal cover. Effects on big game from thermal cover removal would be most apparent during more severe winters and heavy snowfall. Additionally, longer sight distances and the reduction in hiding cover may increase big game vulnerability risk in the project area. Collectively, since: 1) minor changes in open roads or motorized access for the general public would be anticipated, 2) sizeable amounts of amounts of winter range habitat would be affected (748 acres), 3) small patches of dense conifer regeneration would be protected where possible, 4) elk security habitat would not be affected, 5) sight distances would increase on 847 acres, which could increase big game vulnerability and associated hunting mortality risk, and 6) habitat connectivity within the larger winter ranges would not be appreciably altered, minor adverse effects to winter range habitat would be anticipated that would affect big game in the project area.

Cumulative Effects of the No-Action Alternative on Big Game Habitat

No changes in big game habitat would be expected, as no timber harvesting activities would occur. Existing levels of cover would persist. Past and ongoing forest management projects not associated with the proposed Lake Rogers Timber Sale have affected big game habitat in the project area, and other proposed projects could disturb big game species and/or alter habitat quality in the future. No additional cumulative effects to big game habitat quality are expected to result from the No-Action Alternative that could affect big game species in the CEAA since: 1) no big game habitat would be altered and continued maturation of forest cover would improve thermal cover and snow intercept, and 2) the level of human access would remain unchanged.

Cumulative Effects of the Action Alternative on Big Game Habitat

Forest stands providing suitable thermal cover and snow intercept would be altered on approximately 748 acres (1.7%) of white-tailed deer winter range within the CEAA (44,047 acres). Elk security cover would not be affected within the CEAA. Reductions in thermal cover and snow intercept would be additive to past reductions within the CEAA due to forest management (39,046 acres). The effect of this potential thermal cover/snow intercept removal would be expected to be somewhat greater as the winter range includes many habitats that are developed and do not provide these important habitat features. Minimal adverse changes in big game habitat quality within the larger winter range would be expected. Harvesting and motorized disturbance within the CEAA associated with the proposed project could temporarily (1-4 years) displace wintering big game and reduce cover on winter range. Displacement associated with this alternative would be additive to any displacement associated with ongoing timber harvesting within the CEAA. Continued maturation of previously harvested stands within the cumulative effects analysis area would improve hiding cover and partially offset these current losses within 20 to 40 years. Under the action alternative, existing restricted roads and new road construction used for harvesting activities could temporarily increase access and disturbance, which could result in a slight temporary increase in open road density from 1.28 miles/sq. mile to 1.29 miles/sq. mile within the CEAA. After harvesting, open road density would be 1.25 mi/sq. mile in the CEAA and continue to facilitate hunter access. Thus, minor adverse cumulative effects to big game winter range habitat would be expected since: 1) harvesting would reduce overall levels of cover on 748 acres (6.1%) of winter range containing mature stands, 2) overall

habitat quality within the larger winter range would be slightly altered, 3) thermal cover and snow intercept would improve as younger stands mature, 4) logging activities would create temporary disturbance lasting 1-4 years, and 5) motorized disturbance and access would increase temporarily (1-4 years), but long-term open road densities would undergo a minor decrease.

Wildlife Mitigations associated with the Action Alternative

- Maintain a minimum of 2 snags and 2 snag recruitment trees over 21 inches dbh per acre, on average, for all harvest units. If unavailable, retain the next largest size class. Additional snag resources could be retained within the harvest units. Favor ponderosa pine, western larch and Douglas-fir for snag retention and recruitment.
- Retain 10-15 tons CWD post harvest and emphasize the retention of downed logs ≥15 inches dbh where they occur as per LY-HB2(1) and (2) (*USFWS AND DNRC 2010, Vol. II p. 2-48).*
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.444(2)* and GB-PR2 (*USFWS AND DNRC 2010, Vol. II p. 2-5*).
- Contractors will adhere to food storage and sanitation requirements as per GB-PR3 (*USFWS AND DNRC 2010, Vol. II p. 2-6*).
- If a threatened or endangered species is encountered, consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428* through *36.11.435*).
- Close roads and trails to the extent possible following the proposed activities to reduce the potential for unauthorized motor vehicle use and/or loss of snags to firewood gathering.
- During the harvest activities, restrict public motorized access along restricted routes through signing when operations are active and closure devices when operations are inactive (nights, weekends, shutdown periods).
- Retain patches of advanced regeneration and dense understory where possible.
- Prohibit timber harvesting within 500 feet of Lake Rogers (Section 30) from February 1 through August 15 to minimize disturbance to breeding bald eagles and common loons.
- Prohibit harvest operations in Section 20 within ¼ mile of active red-tailed hawk nest between April 1 and August 15 and within ½ mile of the nest between April 1 and July 15.

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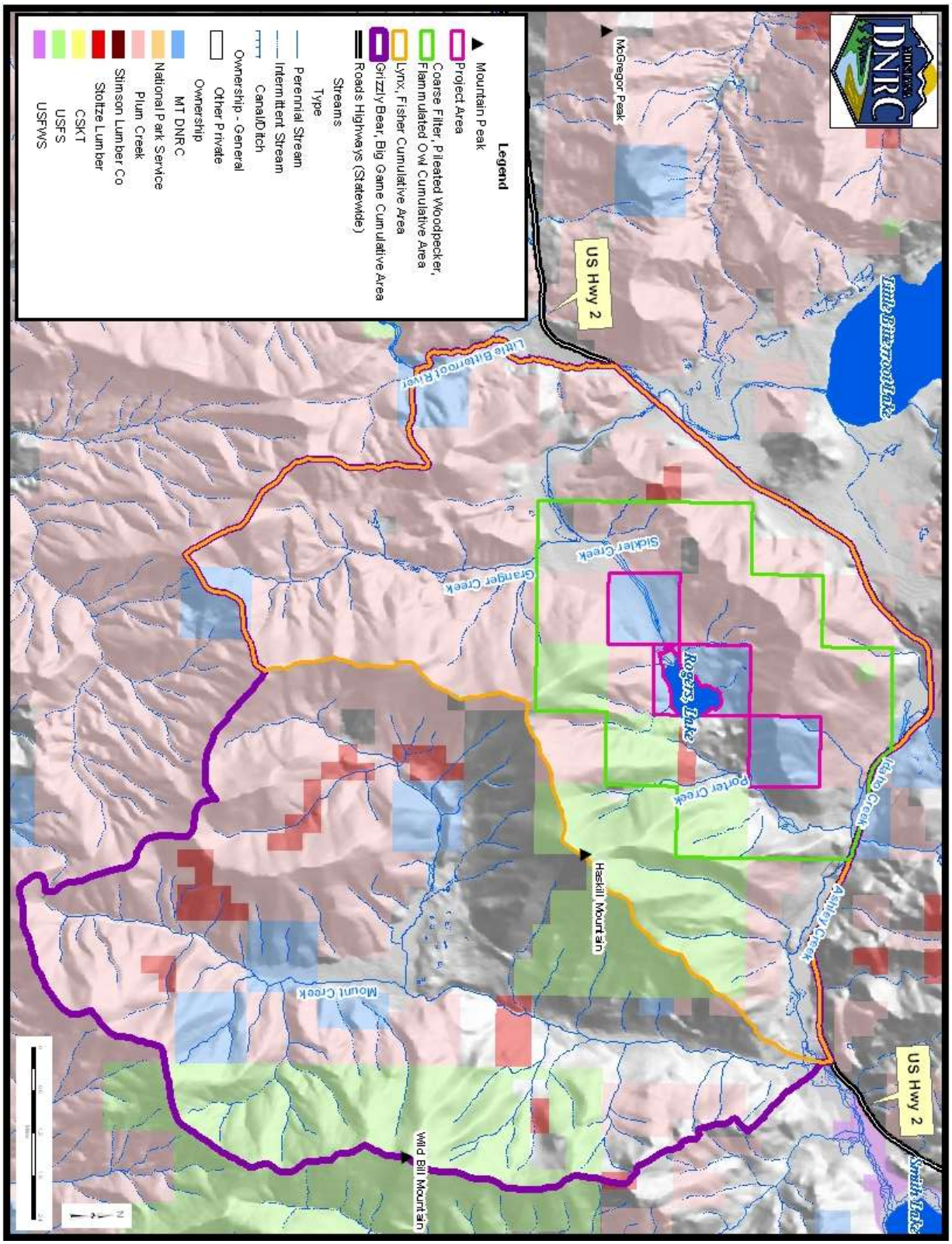
FIGURE W-1 – WILDLIFE ANALYSIS AREAS. *Areas used to assess effects of the action and no-action alternatives on wildlife and wildlife habitat.*



Attachment III
Mitigations

Mitigation Measures for Action Alternative

The following mitigations would be required under the action alternative:

Vegetation

- Grass seed new and disturbed roads and landings; spot spray new weed infestations
- Washing logging equipment prior to use.
- Trample slash in skid trails
- Treating existing weed populations along or within roads with herbicide spray.

Water Resources and Soils

- Upgrade roads to incorporate Forestry Best Management Practices (BMPs)
- Limit timber harvest activities to time when ground is frozen or soil moisture is below 20%
- Apply all applicable Forestry Best Management Practices (including Streamside Management Zone Law and Rules).

Wildlife

- Maintain a minimum of 2 snags and 2 snag recruitment trees over 21 inches dbh per acre, on average, for all harvest units. If unavailable, retain the next largest size class. Additional snag resources could be retained within the harvest units. Favor ponderosa pine, western larch and Douglas-fir for snag retention and recruitment.
- Retain 10-15 tons CWD post harvest and emphasize the retention of downed logs ≥15 inches dbh where they occur as per LY-HB2(1) and (2) (*USFWS AND DNRC 2010, Vol. II p. 2-48).*
- Prohibit contractors and purchasers conducting contract operations from carrying firearms while on duty as per *ARM 36.11.444(2)* and GB-PR2 (*USFWS AND DNRC 2010, Vol. II p. 2-5*).
- Contractors will adhere to food storage and sanitation requirements as per GB-PR3 (*USFWS AND DNRC 2010, Vol. II p. 2-6*).
- If a threatened or endangered species is encountered, consult a DNRC biologist and develop additional mitigations that are consistent with the administrative rules for managing threatened and endangered species (*ARM 36.11.428* through *36.11.435*).
- Close roads and trails to the extent possible following the proposed activities to reduce the potential for unauthorized motor vehicle use and/or loss of snags to firewood gathering.
- During the harvest activities, restrict public motorized access along restricted routes through signing when operations are active and closure devices when operations are inactive (nights, weekends, shutdown periods).
- Retain patches of advanced regeneration and dense understory where possible.
- Prohibit timber harvesting within 500 feet of Lake Rogers (Section 30) from February 1 through August 15 to minimize disturbance to breeding bald eagles and common loons.

- Prohibit harvest operations in Section 20 within ¼ mile of active red-tailed hawk nest between April 1 and August 15 and within ½ mile of the nest between April 1 and July 15.

Attachment IV
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